Economic Incentives for the Sustainable Management and Conservation of Tropical Forests

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DECLARATION

This is to certify that, except where specific reference is made, the work described in this thesis is the result of the efforts of the candidate. Neither this thesis, nor any part of it, has been presented, in candidature for any degree at any other University.

Signed  .....

Michael Richards * (Candidate)

Signed .....

Supervisor

Date: .....

* Please note that some of my earlier publications appear under the name E.M.Richards.

DEDICATION

I dedicate this thesis with my heartfelt gratitude and love to my long-suffering and very supportive family - Sarah, Thomas, Tushari and William Richards. I also dedicate it to Bahá'ú'lláh, Prophet Founder of the Bahá'í Faith, whose universal spiritual teachings of the 19th century have provided me with a global vision of social and environmental issues, and which include a clear understanding of the need for global governance in areas of paramount importance to the welfare of humanity since "the world is but one country and mankind its citizens."

ABSTRACT

This PhD by Publication traces through 13 of my publications on economic incentives for forest management and conservation in tropical countries (with a regional bias towards Latin America), including several papers focused on participatory forest management or community-based conservation. The papers show how my thinking has evolved from a focus on market and non-market incentives, to an increasing emphasis on governance and regulatory incentives in explaining stakeholder behaviour to the forest resource, as well as the equity impacts. They reveal that positive incentives and win-win (environmental and poverty reduction) outcomes will only emerge when the underlying market, policy and institutional failures are tackled. Because of their public good values, the survival of tropical forests is contingent on the actions of the international community and governments.

Sustainable forestry, therefore, depends on a combination of domestic governance progress to control illegal logging and the rent-seeking powers of vested interest groups, global governance regulations which create markets for environmental services, secure property rights for resident stakeholders and extra-sectoral policies that moderate land use opportunity costs. The current main hope for tropical forests is 'avoided deforestation', since this will need to tackle the forest governance problems and underlying multi-sectoral drivers of deforestation if it is to be successful. It represents a balanced market (payments for ecosystem services) and supply-side (improved governance) response to what is essentially a 'public goods' management problem, but will need to overcome some major political economy challenges.

CONTENTS

3 REFLECTIVE OVERVIEW

ABBREVIATIONS

AD	Avoided Deforestation
CDM	Clean Development Mechanism of the Kyoto Protocol
CFE	community forestry enterprise
CIFOR	Centre For International Forestry Research, Bogor, Indonesia
CPR	common property (or pool) resource
DFID	UK Department For International Development
EC	European Commission
ESA	economic stakeholder analysis
FAO	Food and Agriculture Organization of the United Nations
FLEG	Forest Law Enforcement and Governance
FMU	Forest Management Unit
FRP	Forestry Research Programme of DFID
FSC	Forest Stewardship Council
IIED	International Institute for Environment and Development
IIM	innovative incentive mechanism
ICDP	integrated conservation and development project
ITTO	International Tropical Timber Organization
JFM	Joint Forest Management (PFM in India)
NAFTA	North American Free Trade Agreement
NGO	non-governmental organisation
NRI	Natural Resources Institute
NTFP	non-timber forest product
ODA	UK Overseas Development Administration
ODI	Overseas Development Institute
PES	payment(s) for environmental services
PFM	participatory forest management
PRA	participatory rural appraisal
RPBR	Rio Platano Biosphere Reserve (Honduras)
SFM	sustainable forest management
UNDP	United Nations Development Programme
WWF	World Wide Fund for Nature

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1 INTRODUCTION

1.1 Background and definitions

The theme of this PhD by Publication is an exploration of economic incentives for the sustainable management and conservation of tropical forests. This investigation has spanned 17 years (1990-2006) of my career in development, which commenced in 1977. Prior to 1990, I worked for 13 years as an agricultural or rural development economist on long-term assignments for the UK Overseas Development Administration (ODA) and the Food and Agriculture Organisation (FAO) of the United Nations in Malawi, Sri Lanka, Mexico and Honduras.

It is important at the outset to define the term 'incentive' since this is often used to mean a subsidy. Here it is used in a broader sense to refer to the economic motivation of forest managers and other stakeholders to manage or conserve (or not) the forest resource, in response to a set of market, policy and/or institutional signals or messages received. These signals either come directly from the market place in the form of a price change, or more indirectly as the result of a legal, policy or institutional change, and motivate forest users or managers to become more or less interested in 'sustainable forest management' (SFM) or conservation.

A second clarification is my use of the word 'economic'. I use 'economic' in a broad sense to refer to the values of a range of forest goods and services, including environmental and social benefits and costs, on the basis that they have an economic value to society, even though this may not be quantifiable. The terms SFM and participatory forest management (PFM) are also used continuously in this narrative. There are at least fifty definitions of SFM in the literature, an indication of how controversial it is. An authoritative one is forest management that seeks to ensure that "forest-related activities should not damage the forest to the extent that its capacity to deliver products and services – such as timber, water and biodiversity conservation – is significantly reduced. Forest management should also aim to balance the

needs of different forest users so that its benefits and costs are shared equitably" (International Tropical Timber Organization, 2005)[1]. Two aspects of this definition are striking: firstly the message that 'perfect' sustainability is unrealistic and it is more a question of minimising ecosystem damage. It is therefore tempting to use terms like 'well-managed forest' or 'good forest management', but SFM is so widely used that it is easier to stick to convention. The second aspect of this SFM definition is the importance given to social sustainability. It should also be pointed out that SFM is not the same as 'appropriate' forest management, since deforestation can sometimes be appropriate.

Participatory Forest Management (PFM) can be defined as any attempt at forest management involving local people, whether in the form of communities, small groups or individual villagers co-operating in a larger programme. In PFM the social and livelihood benefits of forest management are given more emphasis than in an 'industrial forestry' setting. The terms SFM and PFM are used here to refer mainly to the management of naturally occurring forests, rather than to forestry based on planted trees, such as plantation forestry, trees on farms and agroforestry.

The scope of this thesis is limited in terms of forest type and geographically. The author's main experience has been of natural forest management and conservation in the tropical and sub-tropical forests of Latin America and Ghana, and to a lesser extent, drier sub-tropical montane forests of Nepal and Northern India. Therefore, the thesis and its policy prescriptions do not extend to, for example, the arid and semi-arid forest systems of Africa and Asia or the wetter tropical forest systems found particularly in Southeast Asia, including the important adaptive forest management experiences involving these and other forest systems (Buck et al, 2001). Similarly, the thesis has less to say

[1] Another useful and simpler definition is 'the management of forests in a way which optimises the social, economic and environmental benefits of forests for both present and future generations' (Dresner et al., 2006).

about agroforestry, farm forestry or small or large-scale plantation forestry[2]. It is also geographically constrained in its scope given that much of the analysis is from Latin America, with only three papers (3, 9 and 10) involving primary data collection and analysis from other regions. The policy discussion and conclusions in Section 3 are therefore less relevant to Asia and Africa.

1.2 How important are tropical forests?

The importance of this research narrative rests firstly on the social, environmental and economic importance of tropical forests, and secondly on the argument that economic or market incentives (or rather disincentives) for forest managers or local forest users are the main drivers of this deforestation and degradation. Although it is very difficult to substantiate data on numbers of 'forest-dependent' people, the literature comes up with some numbers: for example, Molnar et al (2004) state that between one and 1.5 billion of the world's poorest people live in and around forests, and 80 per cent of the extreme poor (less than $1 per day) depend to some extent on forest resources for their livelihoods. These include an estimated 60 million indigenous people who value tropical forests for a range of livelihood, spiritual and ecological services (Shvidenko et al., 2005).

With the scientific acceptance of climate change, carbon sequestration has become the most valuable ecological service of tropical forests. Estimates of the proportion of anthropogenic emissions of carbon dioxide due to (mainly tropical) deforestation range from 18 to 25 per cent, and over the past 150 years, forest conversion has contributed an estimated 30 per cent to the atmospheric build-up of carbon dioxide. As the Stern (2006) Review points out, even 18 per cent is more than the emissions of the global transport sector. Forests and their soils hold more carbon than there is in the atmosphere. Tropical forests hold particularly high carbon stocks, typically 50 per cent more per hectare than temperate and boreal forests; more of this is in the top metre of soil than in the woody biomass (Shvidenko et al., 2005).

[2] Although outside the papers reported here, the author has experience with some of

Forests also provide important hydrological functions, although the physical relationships are complex, poorly understood and often site specific. However payments for watershed protection services (clean water, reduced siltation and more controversially prevention of flood damage and enhancement of dry season flows) have become significant in several Latin American countries, like Mexico, Costa Rica and Colombia (Scherr et al., 2006). Win-win benefits are gained when small farmers living in upper watershed areas are compensated for sustainable farming practices.

Tropical forests form one of the most biodiverse habitats on earth, and contain 50-90 per cent of the Earth's terrestrial species (Shvidenko et al., 2005); this gene pool includes innumerable natural medicinal elements, known or undiscovered, of great importance to the pharmaceutical industry and, more importantly, medical science. It is also estimated that up to 75 per cent of people in developing countries use traditional medicines, many of them from tropical forest ecosystems (Shvidenko et al., 2005). Most importantly, biodiversity integrity enables the provision of a range of ecological services.

As regards more tangible forest products, it is estimated that forests globally produce about 3.3 billion cubic metres of wood, over 60% of which is used for fuel, about 5,000 commercial products, and up to 30-40 per cent of the grass and fodder requirements of livestock in many developing countries (Shvidenko et al., 2005). Overall the forest sector contributes about 2 per cent of global gross domestic product, and is a significant source of employment and foreign exchange for many countries, although a problem for forestry is that it provides less employment than most other land uses.

An important argument underpinning all the above benefits is inter-generational equity, which refers to the right of future generations to enjoy similar benefits to the current generation. While forests are clearly valuable to society, they are not always more valuable than other land uses. To an economist, a forest is a form of capital which can be converted into other

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these systems in Honduras, Bolivia, Costa Rica, Nepal and India.

forms of capital. In practice, conversion can be justifiable to meet socio-economic objectives according to the context, for example, when forests are abundant and the economy is highly dependent on agriculture. Therefore forest economists sometimes use the terms 'appropriate' and 'inappropriate' deforestation (Kaimowitz and Angelsen, 1998). This of course raises the question of *appropriate for who?* The problems of tropical forestry stem from its multiple management (or conversion) objectives and stakeholders, and the trade-offs between them.

1.3 The 'difficult economics' of SFM and conservation

The evidence of deforestation and forest degradation show quite clearly that SFM is not viable in many forest ecosystems. A recent comprehensive survey estimated that only 5 per cent of tropical forests are well or 'sustainably' managed (ITTO, 2006). According to the Millennium Ecosystem Assessment (Shvidenko et al., 2005) and FAO (2005), for the period 2000 to 2005, annual tropical deforestation has been 12-13 million hectares, including about six million hectares of primary forest, and further large areas are degraded. These figures are net, so take account of reforestation, afforestation and other categories of 'forest transition', including regrowth of secondary forestry on abandoned farmland. A caveat is that there is no clear estimate of the latter, although recent reports indicate this is greater than previously thought (Rudel et al., 2005). Latin America is the region with the highest net loss (about 4.3 million hectares) followed by Africa (about 4 million hectares).

In view of the perceived benefits, environmental economists have attempted to place economic values on tropical forest conservation. While these estimates are based on controversial valuation methodologies and are subject to an enormous range of error, they can be influential in high-level policy arenas. For example, Pearce et al. (2002: 477) estimated that the net annual economic value of tropical forest conservation based only on its non-timber values was in a range of US $685-4,500 per hectare, with most of the variation depending on carbon values (without these, it would fall to less than $100 per hectare). Another often quoted study by Costanza et al. (1997)

estimated a mean annual value of $1,500 per hectare in the Amazon region, excluding forest products and recreation.

However one regards the credibility of such calculations, it is clear that only a fraction of the 'real' value of tropical forests is realised or 'captured' - most forest values are 'externalities' with no market value. And where there are market values, as for timber and non-timber forest products (NTFPs), they tend to be low due to policy or institutional failures. For example, illegal or poorly regulated logging results in a high supply of timber on domestic markets and depresses prices.

This situation is compounded by the biological problem that trees grow slowly and in natural forests can take 80-100 years to reach their commercially optimal size. The main problem here is the opportunity cost of forestry investments over time. This is the compound interest that could be earned on the investment. Effectively time is the main cost of forestry, and has a major effect on it economic viability. For example, an increase in the discount rate from 8 to 12 per cent halved the net present value of sustainable forestry in a major economic study reported in Chomitz et al. (2006).

Furthermore, the 'difficult economics' is more acute in more biodiverse forests. For example, the economics of timber-based SFM is more difficult in the species diverse forests of Latin America and West Africa than for the dipterocarp and natural teak forests found in large parts of South-East Asia. This is due to diseconomies of scale and because markets for lesser-used timber species are relatively undeveloped. SFM also tends to be higher cost when local communities are involved. A further problem for natural forest hardwoods is the increasing competition from hardwood plantations or even chemically treated softwoods.

Underlying the difficult economics of tropical forests is that, since they produce a range of good and services, there is a range of interested stakeholders. In different contexts, these include indigenous peoples, migrant colonist farmers, industrial forestry concessionaires, absentee landowners,

governments (including forestry and agricultural departments), donors (claiming to represent the international community's concern for environmental and social objectives), national and international environmental or development NGOs, pharmaceutical companies, national and foreign wood product processors, exporters, retailers in importing countries, etc. Therefore forest management often involves a complex set of trade-offs between multiple stakeholders. For this reason, state policies over tropical forests are politically rather than technically determined, and forest governance plays a key role in the distribution of the benefits between the stakeholders. Political economy factors have resulted in policies and institutions that skew the benefits to elites or vested interested groups.

A combination of market, policy and institutional failures therefore results in the undervaluation (compared to its 'real value' to society) of forest land and resources by policy makers, forest users and other stakeholders. Except for more remote or inaccessible forests, there is therefore a tendency for them to be replaced by alternative land uses. There are a plethora of economic studies, for example from Cameroon, Costa Rica, Sumatra and India, showing that the returns from even subsistence agriculture far outstrip SFM, which typically provides a net annual income of $100-200 per hectare (Chomitz et al., 2006). Simply stated, deforestation or degradation happens because it is more profitable to fell a tree or forest than to keep it for its long-term value.

Therefore a recent high profile review of the status of tropical forest management in 33 countries found that, of the constraints to SFM "*probably the most important, and the most generally applicable, is that sustainable management for the production of timber is less profitable to the various parties involved (government, concessionaires and local communities) than other possible ways of using the land*" (ITTO, 2006:11). How to achieve positive 'economic incentives' for forest users or managers to engage in SFM or conservation is therefore the main challenge for tropical forests.

1.4 The beginning of the journey ... and its continuation

I began to explore the theme of economic incentives for SFM and conservation in 1990 when granted a one year 'In-Service Training Award' by the UK ODA. Part of this year was spent learning about forestry and forest policy issues during two terms as a 'recognised student', and in a three month 'Social and Agroforestry' course, at the Oxford Forestry Institute, University of Oxford. I spent the remainder of the year researching PFM and biodiversity conservation projects in Honduras, Mexico, Costa Rica and Belize.

During this experience I started investigating two interconnected issues which formed the basis of my research for the next 15 years. The first was the economic viability of 'SFM' and biodiversity conservation, since it was clear that the tropical forest ecosystems of Central America were being rapidly degraded, and most attempts to manage or conserve forests were failing. The second issue was the participation of local users or communities in projects promoted by international, state and NGO agencies: I was interested in the different ways of promoting participation, and how sustainable this participation was. This raised questions such as whether the benefits of PFM outweigh the costs, both in the short and long term, how to quantify the benefits and costs for local people, how to improve the benefit-cost balance of PFM, and how local users balance economic factors with broader social and institutional criteria when making land use or livelihood decisions.

This narrative covers 13 publications (listed in Appendix 1) resulting from this research journey. This process is still ongoing; I have been invited by Forest Trends in 2007 to participate in research to assess the extension of forest management certification to ecological services from SFM and conservation. And the Editor of the *International Forestry Review,* an increasingly influential journal, has expressed an interest in receiving a paper based on my PhD narrative, noting that *'while there are many papers that deal with particular aspects of both market-based and non-market based incentives, I feel there is a lack of published analysis linking the development of thought over time through to the role of regulatory incentives and forest governance issues. I look forward to developing the paper with you'* (Appendix 3).

1.5 Research objectives and hypothesis

The focus of this PhD narrative is my research journey to better understand the 'difficult economics' of tropical forestry, especially natural forest management in Latin America: six of the 13 publications focus on Latin America, one on Ghana, one on Nepal, and five have a more global focus. Specifically it seeks to understand the economic incentives of a range of stakeholders, but especially of local forest users and industrial forest managers, to manage, conserve or degrade natural tropical forests. As a sub-theme, I explore the challenges to effective participation of the rural poor in the management and conservation of tropical forests.

The research hypothesis can be expressed as follows: the main constraint to SFM and conservation of tropical forests is the 'difficult economics' of natural forest management and conservation stemming from market, policy and institutional failures. These cause an 'undervaluation' of SFM and conservation compared to alternative land uses, including unsustainable forestry, which results in disincentives for local or industrial forest managers. A better understanding of the economic incentives (and disincentives) for key stakeholders will lead to more effective projects and policies, and, especially for PFM, 'win-win' outcomes.

1.6 Structure

The narrative is organised in three main sections: Introduction, Discussion of Publications and Reflective Overview. The second and main section adopts a publication by publication approach, with each publication discussed in five sub-sections:

- Context, including autobiographical information;
- Methods: presentation of the main data collection methods;
- Originality: discussion of the extent to which the publication, in my view, made an original contribution to the literature;
- Reflection and learning: discussion of how the paper contributed both to my personal learning and (in my view) to the wider literature;

- Postscript: this discusses how later research by myself or others in the same thematic or geographical context reinforced or otherwise informed the original publication findings.

The Reflective Overview presents a more discursive and synthesised analysis of the publications, and brings together the learning from my publications with more recent or seminal literature. This leads to a discussion of key policy challenges for the future of tropical forests, and some research recommendations. This discussion deliberately goes beyond the scope of my papers, including, for example, a discussion of the potential of 'avoided deforestation', since this is regarded as an 'incentive' measure of major current importance. There is therefore a considerable element of generalisation from the published papers in terms of forest type and geographical scope. The findings, research recommendations and conclusions are most relevant for SFM and conservation of natural forests in Latin America, and to a lesser extent in West Africa and montane systems in South East Asia, and less relevant to forest systems involving planted trees, for which the economics is perhaps less 'complex', or for other forest types and management arrangements, as discussed in Section 1.1.

The five Appendices are organised as follows:

1. Details of publications, sub-publications and conference presentations associated with the main publications;
2. Statements of co-authors;
3. Impact ratings of journals and the number of Google Scholar citations;
4. Book reviews, other references to publications, and letter from the Editor of *International Forestry Review;*
5. The Publications.

2 DISCUSSION OF PUBLICATIONS

2.1 PFM in Honduras, Mexico and Peru (Publication 1)

Richards, M. 1993. Lessons for Participatory Natural Forest Management in Latin America: Case Studies from Honduras, Mexico and Peru. *Journal of World Forest Resource Management* 7:1-25.

2.1.1 Context

During my ODA 'In-Service Training Award' (1.4), I spent three months in Central America in early 1991 researching promising participatory approaches to forest management and biodiversity conservation. The time was spent primarily on a Canadian International Development Agency (CIDA) funded project supporting forest management by small pit-sawing cooperatives in Northeast Honduras. This was supplemented by short trips to visit PFM and biodiversity conservation projects in Southeast Mexico (where I had lived for four years, and was very familiar with the context), Costa Rica and Belize.

This paper focuses on three PFM experiences in Latin America: the pit-sawing cooperatives of Honduras, the forest '*ejidos*' (land reform cooperatives) of the 'Pilot Forestry Plan' in Quintana Roo, Mexico and the indigenous Yanesha Forestry Cooperative in the Palcazu Valley, Peru. A paper specifically on the forest *ejidos* of Mexico was published in the *Commonwealth Forestry Review* (Richards, 1991).

2.1.2 Methods

This publication synthesises primary and secondary data collected in Honduras, Mexico and Peru. For Honduras and Mexico, data collection methods included semi-structured interviews with farmers, focus groups, project staff, forestry department officials and other key informants. I also revised sales data, cost accounts and other records. The Peru case study was based on secondary data sources and interviews with staff from support

institutions, and for all three case studies I revised project documents and published papers.

2.1.3 Originality

This was one of the first attempts to undertake a comparative social, environmental and economic analysis of PFM experiences in Latin America. This included an attempt to consider the economic viability of forest management (in the case of the Mexico and Honduras case studies), although this was more of a 'snapshot' than a thorough economic analysis. At this time there was a paucity of micro-economic data on PFM.

2.1.4 Reflection and learning

The paper reveals that a combination of policy, social, institutional and biological factors contributed to the relative success of the Mexican experience compared to the other two PFM situations. The more positive incentives for forest management in Mexico derived from tenure security (the *ejidos* held inalienable property rights established by the Mexican Constitution), relative political and social stability, supportive provincial government and long-term support by the German aid agency GTZ using participatory methodologies. In addition, forest management in Mexico seemed to be reasonably viable due to the combination of some high value timber species and *chicle* (*Manilkara zapota),* an NTFP used in chewing gum.

By contrast, tenure uncertainties and vacillating state policies dominated by industrial forestry interests, facilitated by an often corrupt forestry authority, prevailed in Honduras; and the second order cooperative which marketed the timber supplied by the pit-sawing cooperatives also suffered from inefficiency and corruption. In Peru, socio-political instability posed a severe constraint to the marketing of timber, so that the community forest enterprise (CFE) was hardly able to pay salaries, and had become heavily dependent on donor support.

It was also observed that in the case of the Mexican forest *ejidos*, forest management formed part of a broader livelihood mosaic: forestry was

integrated with maize, honey and cattle production. Mexican *ejidatarios* (*ejido* members) were first and foremost farmers who saw forestry as a valuable complementary activity bringing in income at lean times of year and providing greater livelihood security. An early personal realisation was that a key to PFM is to recognise and encourage multiple purpose land use rather than by promoting a narrow commodity-oriented approach, focusing on timber or a specific NTFP. Finally, this first attempt to assess the viability of forest management made me realise the complexity of a full economic study of SFM, especially the need for reliable biological data to assess long-term resource productivity, and estimate the 'with' and 'without' SFM extraction levels.

2.1.5 Postscript

Later research (associated with Publications 4, 6, 9, 11 and 12) has provided me with various opportunities to monitor the progress of PFM in Honduras and Mexico; I also learned that the Peru project was dissolved due to economic insolvency. The Honduran project has struggled on in the face of continuing policy and tenure uncertainties, ineffective marketing and 'unfair competition' from illegal timber, causing most cooperative members to abandon forest management or become illegal loggers. The only experience of the three to prosper has been the forest *ejidos* of Quintana Roo, Mexico.

The latter have also faced major problems, including weak markets and over-harvesting of mahogany and *chicle*. Cheap timber imports following the North American Free Trade Agreement (NAFTA) in 1994 did not help timber prices, and another threat was the pro-NAFTA modification of the Mexican Constitution in 1992. This opened the way for the sub-division and sale of *ejido* land. In practice however, this has happened only a very modest scale. It is significant that the *ejiditarios* and their families gave significant value to the non-market benefits of their forests in the case study conducted for Publication 9. A recent study (Bray et al., 2004) reports the development of 'sustainable landscapes' among the forest *ejidos* of Quintana Roo in which institutional innovations, including the development of extractive reserves for *chicle* production, and forest transition (secondary forest regrowth) are playing

important roles. The resilience of the Mexican forest *ejidos* has also been helped by the introduction of payments for hydrological services in a 2003 Forest Law (Scherr et al., 2006).

2.2 Non-timber forest products in Amazonia (Publication 2)

Richards, M. (1993) The Potential of Non-Timber Forest Products for Sustainable Natural Forest Management in Amazonia. *Commonwealth Forestry Review* 72 (1): 21-27

2.2.1 Context

Following my training award year, I spent eight months (November 1991 to June 1992) at the Natural Resources Institute (NRI), Chatham. In early 1992, NRI was commissioned by ODA to undertake a review of the management and commercialisation of NTFPs in the Amazon region. The importance of this topic was that some Northern observers had identified major potential win-win benefits from the management and commercialisation of Amazonia's plethora of NTFPs. An influential paper in *Nature* (Peters et al., 1989) proposed that SFM of NTFPs was a viable and equitable conservation option for large areas of the Amazon. But the paper had also come in for criticism by Latin American researchers like Homma (1989) (and subsequently Pinedo-Vasquez et al., 1992) who were more sceptical of these claims. ODA was clearly concerned to obtain another view. NRI also published a longer version of the journal paper (Richards, 1993).

2.2.2 Methods

The paper was based on revision of grey and published literature, and correspondence with key informants, especially social anthropologists and botanists based in the USA. It also drew on my observations from a field trip to the Bolivian Amazon region in 1990.

2.2.3 Originality

In retrospect, the themes of the paper do not appear original, but at the time it was possibly quite forward looking. Firstly, it foreshadows some of the

principles later embodied in the Sustainable Livelihoods framework (Carney, 1998) adopted particularly by the UK Department for International Development (DFID). Thus the paper highlights the livelihood dangers associated with a commodity-based approach, particularly the way it can narrow the livelihood basis of the family economy and increase vulnerability.

Secondly, the paper warns of the dangers of a market-based approach to forest conservation in the context of a weak regulatory framework and insecure land tenure. Extractive reserves emerged as a more durable option because of their stronger institutional and tenure basis for forest management, even though market prospects for the main extractive reserve products, rubber and Brazil nuts, were unfavourable. To some extent this foreshadowed Joseph Stiglitz's (1998) exhortation to strengthen institutions and regulatory frameworks when (or ideally before) promoting market-based approaches.

2.2.4 Reflection and learning

The paper shows that, if left to market forces, forest management based on commercial NTFP extraction tends to result in over-exploitation, degradation and conversion to other land uses, as well as serious poverty impacts. The main personal learning was an increased realisation of the risks of a market commodity based approach. I observed that in a weak regulatory and tenure context, the forest resource and the poor are highly vulnerable to fluctuations in market prices. Higher rewards increase the incentives for previously uninterested stakeholder to exert their rent-seeking powers. Also the risks are greater when products are traded internationally – local and national markets are more stable.

Extractive NTFPs are particularly prone to over-exploitation and resource depletion, due to the well documented NTFP 'boom and bust' cycle and the potential for destructive harvesting methods (as for timber). More sustainable and equitable experiences derived from secure tenure, stronger rights and control by local communities, and, in some cases, vertical market integration. International market niches like 'fair trade' were sometimes an option, but

these opportunities were hard to sustain and required long-term donor support (finance, training, extension, etc.).

The paper therefore concluded that, without appropriate institutional and tenure reforms, the expectations were unrealistically high for market-oriented SFM based on NTFP commercialisation. Alternative approaches based on regulatory and institutional reform, as well as payments for environmental services (PES), were needed to secure win-win outcomes. The extractive reserve model seemed to offer most hope.

2.2.5 Postscript

Since 1999, rubber tappers on the extractive reserves of Acre State (Brazil) have received PES from the State government as a result of the Chico Mendes Law. The extractive reserves model has been consolidated and extended as far afield as Mexico (Bray et al., 2004). The durability of the extractive reserves model confirms that, at least in the context of NTFP extractivism, a stronger institutional and tenure basis combined with a PES mechanism has more potential for securing win-win outcomes than a more market-based approach – but also requires considerable political will and public investment.

A recent research study on the commercialisation of NTFPs in Mexico and Bolivia (Marshall et al., 2006) also confirms the need for a livelihoods rather than commodity-based approach, as well as the importance of the tenure and institutional basis. It found that secure tenure and stable common property resource (CPR) systems were key to SFM objectives, but local forest users generally only engage with the informal market sector due to entry barriers to formal markets (legal and administrative requirements) and lack of market information. It observes the potential of niche markets for organic or fair trade NTFPs, but also warns that certification costs are a constraint for small-scale producers.

2.3 Incentives for forest management in Ghana (Publication 3)

Richards, M. (1995) The Role of Demand Side Incentives in Fine Grained Protection: a case study of Ghana's Tropical High Forest. *Forest Ecology and Management* 78: 225-241

2.3.1 Context

Following my spell at NRI, I felt the need for more field experience in natural resource economics. I was fortunately able to obtain this as team leader and natural resources economist for the International Institute for Environment and Development (IIED) on a 'Study of Incentives for High Forest Management in Southern Ghana'. This research project was funded by UK ODA and the Danish aid agency DANIDA, and undertaken at the request of the International Tropical Timber Organisation (ITTO). This assignment ran from August 1992 to July 1993.

2.3.2 Methods

The paper was based on primary data, supported by revision of published and grey literature. An economic survey of 17 concessionaires and 16 timber processors was conducted using a purposive sampling approach. This included analysis of company accounts, and was supplemented by questionnaires and key informant discussions. Participatory rural appraisal (PRA) methods were used to discuss community level issues.

2.3.3 Originality

This paper was quite original, although not unique, in its efforts to trace systematically the impacts of key forest sector policies, especially forest pricing and trade policies, on stakeholder incentives to manage or degrade the forest resource. These stakeholders were concessionaires, timber processors, the state forestry department, farmers, forest communities and 'stool chiefs', the traditional landowning authorities. Most forest land was held or managed by the state, represented by the Forestry Department, but belonged to communities represented at least symbolically by the stool chiefs.

It was also innovative in its analysis of the distribution of the 'stumpage value' and 'economic rent'[3]. By assessing how surplus profit was distributed between the stakeholders, it revealed the distributive impacts of forest policies. Since forest fees, in the form of log royalties and a plethora of minor charges, were very low, a massive fiscal transfer from the public to the private (or industrial) sector was identified. Ghana's log export ban exacerbated the undervaluation of the forest resource since it resulted in cheap domestic log prices, which in turn subsidised timber processors and increased wastage. These findings were similar to a seminal study of forest pricing and trade policies in Indonesia (Gillis and Repetto, 1988). Mine was one of the first empirical studies in Africa to support the Indonesian analysis, and therefore reinforce its policy implications. A referee of the journal paper commented that my paper confirmed a long-held hypothesis about the impacts of an undervalued forest resource stemming from inappropriate forest sector policies.

2.3.4 Learning and reflection

The paper held three main personal lessons. Firstly, it provided evidence that trade restrictions, like log export bans, combined with the under-pricing of timber from state forestland, results in undervaluation of the forest resource. The trade and forest pricing policies caused severe over-capacity and inefficiency in Ghana's timber industry, as the cheap timber encouraged excess demand, inefficiency and wastage. Another consequence of under-pricing state timber was to encourage rent-seeking behaviour – if the state does not claim the 'surplus profit' element then vested interest groups will. Combined with weak tree rights and tenure for local forest users, this situation caused local stakeholders to adopt negative attitudes to the forest resource. Thus the incentives for both the 'winners' and 'losers' of state policies were to degrade the resource.

A second main lesson, which reinforced my learning from the first two papers, was that market-based or demand side incentives are insufficient drivers of

[3] Stumpage value represents the standing value of the trees or forest and is equivalent to the 'surplus' profit before taxation, while economic rent is the surplus or profit after taxation.

SFM, and must be supported by supply-side or regulatory measures. Trade restrictions and forest pricing operate on the demand side, at least for concessionaires and millers, since they determine the price of timber and thus the industrial demand for it. It was concluded that a more effective legal or regulatory framework was needed, especially better 'control at the stump' by the Forestry Department, for example, restrictions on cutting high value or scarce species, heavier fines, etc. But the problem was the political will needed for policies fiercely opposed by vested interest groups – which included leading politicians.

In terms of incentives for SFM, it also made me realise that poorly researched and designed demand-side incentive mechanisms can send out contradictory signals and result in 'perverse incentives'. I concluded that there was no alternative to a balanced 'carrots and sticks' approach to SFM in which demand-side measures, like forest pricing and trade policies, have a 'fine tuning' role.

2.3.5 Postscript

In a study incorporated in Publication 9, I returned to Ghana in 1999 to investigate the incentives for cocoa farmers to maintain timber trees in 'off-reserve' forest areas[4]. This study found that prevailing tree tenure and concessionaire policies, combined with weak control, resulted in perverse incentives for cocoa farmers as regards timber trees. Although many high value timber trees were also good for cocoa due to shade provision and nutrient recycling benefits, farmers preferred non-timber shade trees and would often destroy timber tree saplings. This was because they received no income from the trees they tended, and suffered major uncompensated losses to their cocoa farms during logging. It was further evidence of the disincentives to local stakeholders stemming from policies favouring the timber industry.

[4] Ghana has two main sources of timber: state forest reserves where the forest is allocated to competing forest concessionaires, and the 'off-reserve' resource comprised mainly of trees on farmland, also divided into concession areas.

I also visited Cameroon briefly in the late 1990s and noted similarities to Ghana in terms of both the forestry ecology and political economy. Due to various factors, including persistent support from the World Bank and WWF, Cameroon has made more progress on forest sector reform, including in forest taxation, concession tenure, community rights (including a fair share of the 'forest rent'), state institutions and the regulatory framework (Chomitz et al. 2006: 167-170). Important reforms have included concession allocation based on competitive bids (auctions) for area-based fees, longer-term concession tenure, the introduction of 'performance bonds' encouraging long-term forest management, and improved transparency and monitoring. These incentive measures are by no means new - most were proposed 15 years ago (Grut et al., 1991) - but as in Ghana, vested interests have blocked the reform process. It remains to be seen whether there is sufficient political will for effective implementation.

2.4. Conservation strategies in Honduras (Publications 4a and 4b)

Richards, M. (1996). Protected Areas, People and Incentives in the Search for Sustainable Forest Conservation in Honduras. *Environmental Conservation* 23 (3): 207-217

Richards, M. (1997). Alternative Approaches and Problems in Protected Area Management and Forest Conservation in Honduras. pp.142-156 in de Groot, J. P. & Ruben, R., eds. *Sustainable Agriculture in Central America*. Basingstoke/ London: Macmillan Press; and New York: St Martin's Press. (Papers from the 1995 Annual Conference of the Association for European Research on Central America and the Caribbean, held Oct. 14-15, 1995 in Paris, France)

2.4.1 Context

Following the Ghana study and a consultancy on the economics of silvicultural interventions in SFM in Amazonia, in December 1993 I started work at the Overseas Development Institute (ODI). ODI had obtained a grant from the

European Commission (EC) entitled 'Managing the Forest Boundary' for researching alternative biodiversity conservation strategies. A key interest of the research was to compare the traditional 'fences and fines' approach with more participatory and market-based approaches. Three of the case studies were in Latin America; I supervised studies in Brazil and Guatemala, and conducted the study myself in Honduras.

The Honduran fieldwork was conducted in 1994 and a paper presented at the 1995 Annual Conference of the Association for European Research on Central America and the Caribbean; this paper was subsequently reviewed, edited and published in a book of the proceedings. I had meanwhile submitted a paper to *Environmental Conservation.* Both publications are presented here since, while the journal paper was much more widely cited (19 Google Scholar citations), the book chapter was more thoroughly reviewed and edited, and is, in my view, a better quality paper.

The Honduran study focused on two contrasting protected areas. The learning from this paper can only be appreciated with a short description of them. La Tigra National Park is a small, accessible cloud forest with very high market and non-market values, and where, theoretically, the market-based and participatory approach should have had more success. Situated very close to the capital Tegucigalpa, La Tigra supplied 40 per cent of the city's water supply, and was a prime area for high value cash crops like coffee, vegetables and flowers. Institutionally it was dominated by state agencies with conflicting legal mandates. The Rio Platano Biosphere Reserve (RPBR) was large, remote and relatively inaccessible. Like La Tigra, it was very important for its watershed protection and biodiversity values, but these were less immediate to policy makers. It had much lower population and market pressures. Most of the conservation and development work was carried out by NGOs in the virtual absence of state agencies.

2.4.2 Methods

The research for this paper involved five weeks of fieldwork. Discussions were conducted with a wide range of stakeholders, including key informants in the many state agencies and NGOs working in and around these protected areas. Semi-structured interviews were also held with farmers and other beneficiaries, local government officials, project staff, donor representatives and state policy makers. Many of the key informants were already well known to me from my four years residence there. This ensured good access to project documents and other secondary data sources. I remained in close contact with some key informants, allowing me to update the paper between the fieldwork and publication.

2.4.3 Originality

While originality may be hard to establish, this study provided a good opportunity to compare the social and institutional viability of conservation strategies in two protected areas. The conservation strategies could be classified as:

- a regulatory or 'fences and fines' approach (a);
- a more participatory and market-based approach in which the aim was to promote conservation incentives through sustainable livelihood options linked to the resources of the protected area (b); and
- the development of sustainable farming systems in the buffer zones to reduce pressures on the forest resource (c).

Projects combining strategies (b) and (c), and which aim to reconcile conservation and development objectives, are known as Integrated Conservation and Development Projects (ICDPs) in the literature.

2.4.4 Learning

It was found that the regulatory approach (a) suffered in both areas from weak governance, lack of resources to police the boundaries, and confusing and conflicting institutional and legal frameworks. This included clashes between central and local government following a decentralisation law which increased

the power of municipalities over forestland. This was compounded by tenure insecurity following the 1992 Law of Agricultural Modernisation - neo-liberal legislation that attempted to create an efficient land market, but caused widespread land speculation.

The market-based and participatory approach (b) was also quite unsuccessful in both areas, especially for the conservation objectives. For example, in the RPBR, tenure insecurity, lack of state support and low market values constrained PFM (as found in Publication 1 for the pit-sawing groups in a nearby area). For La Tigra, the main problem was that the high market values attracted vested interest groups that paid scant attention to the law: it was common knowledge that members of the current President's family grew coffee and kept cattle in the nuclear zone. Opportunities to build conservation incentives on the basis of the hydrological and eco-tourism values in La Tigra suffered from the state's interest in the revenue flows. In both areas, a corrupt and complacent state forestry authority, combined with the military's involvement in nuclear zone policing activities, alienated local populations.

The most promising work in both buffer zones was in the development of sustainable farming systems (c) by NGOs like World Neighbours. But while this possibly reduced encroachment by small farmers, it did little to deter commercial logging, farming and ranching interests. This perhaps reflected weak diagnosis of the drivers of encroachment.

The study revealed an urgent need for legal and institutional reform. There was little hope for either a regulatory or market-based approach in the prevailing policy, legal and institutional framework. For example, confused tenure, lack of rights for local communities and weak governance and policing meant that the RPBR was an almost open-access resource; market and legal pressures favoured forest conversion to 'slash and burn' farming followed by ranching. Such pressures limited the scope for participatory approaches to conservation, and there was little option but to fall back on a 'fences and fines' approach. But with Honduras' macroeconomic problems and state downsizing from structural adjustment, resources were woefully inadequate for this.

More positively, the paper revealed to me the potentially complementary roles of state agencies and NGOs in conservation strategies. The former should provide a stable institutional and regulatory environment in which risks are reduced and (ideally) environmental services compensated, while NGOs are better placed to work with communities and farmers.

2.4.5 Postscript

Since 1993, I have returned at regular intervals to both protected areas, including for a study of illegal logging in 2001 (11) and in 2003-2004 on a DFID research study of the adoption of hillside farming technologies in La Tigra's buffer zone. Over the years I have observed some positive trends like the empowerment of local government, especially in watershed protection; a developing interest in PES options; advances in forest governance, including increased transparency; and the 2005 Forest Law which strengthened the usufruct rights of local communities so that PFM is now more of an option.

On the other hand, in the RPBR the state governance void has been increasingly filled by an 'uncivil society' dominated by illegal loggers and drug traffickers; severe macroeconomic problems continue to constrain state efforts to police protected areas; and depressed agricultural prices have increased forest frontier 'push' pressures. There is little evidence that either the market-based or regulatory approach is having a more positive impact now than 12 years ago.

Recent reviews of the ICDP approach indicate that Honduras' experience is not unique, since in general the conservation outcomes of ICDPs have been disappointing (Chomitz et al., 2006; GEF, 2006). One issue is the apparent assumption in many ICDPs that local communities are the main agents of deforestation – if they are not, alternative livelihood options will make little difference. A second point is that successful alternative livelihoods would not automatically reduce community pressures on forests, since higher incomes can accelerate deforestation by making cattle ranching or other land use options more affordable (as found in Publication 7).

2.5 Forest valuation methods and practice (Publication 5)

Richards, M. (1994) Towards Valuation of Forest Conservation Benefits in Developing Countries. *Environmental Conservation* 21 (4): 308-319

2.5.1 Context

My next assignment for ODI was a review of environmental cost-benefit analysis, including the use of forest valuation methods, in project and policy analysis for the Swiss Development Cooperation, followed by case studies applying environmental valuation methods in Bolivia. This review was presented at a workshop of donor and NGO decision-makers in Berne in July 1994, and then written up as a journal paper (also reviewed by James Winpenny, the overall project leader). It relates to the main research theme since it addresses the market failure problem in the undervaluation of tropical forests and their ecosystems. Appropriate valuation can reveal the 'real' value of forests, and assist the design of fiscal and other PES mechanisms that capture or 'internalise' non-market values and costs, and of policy measures to counteract 'extra-sectoral' policy biases against the forest sector.

2.5.2 Methods

This paper was based on an extensive literature review of the theory and application of economic valuation methods to tropical forestry and land use change situations, especially forest conservation.

2.5.3 Originality

While this paper was not at all original, I felt it made a useful contribution to the literature by making a complex topic accessible to a largely non-economist audience, including policy makers, donors, state and NGO advisors. This was achieved through a clearly structured presentation of the underlying concepts of economic valuation and of the valuation methods with case study examples. The paper considered the implications of the experience of forest valuation methods in terms of their reliability, cost, and intelligibility of the

valuation methods to decision-makers. This may have helped policy makers understand the potential, as well as limitations, of these valuation methods.

2.5.4 Learning

This review helped me realise that the main challenge for reliable economic valuation is less to do with the valuation methods and more about specification and quantification of the physical relationships. Hydrological impacts in particular are often poorly understood and complex, and require long-term research studies. Also some benefits are inherently uncertain, for example, the current and future genetic values of biodiversity. It also helped me appreciate the importance of prioritising benefit valuation according to a range of criteria, for example: the relative importance of the benefits to stakeholders, the reliability of the valuation method, the cost of applying it (some methods are very data intensive) and the acceptability of the method to policy makers.

Another lesson was that triangulation and sensitivity analysis are essential. This is again due to technical specification problems, but also because the tendency is for different valuation methods to produce significantly different results. Unit values (prices) also vary from year to year. It is therefore better to present the results of valuation studies as a range of likely values rather than as a single figure. Also rather than attempt a 'total economic value' estimation, it is better to focus on the most important economic values, starting with the market and subsistence values of forest products, and then only attempt to value what is necessary to inform a specific policy or project decision. Finally, it made me realise that the valuation of non-market benefits is as much an art as a science, but creativity must be kept within the bounds of plausibility or the art becomes discredited.

2.5.5 Postscript

My efforts with co-authors to develop a toolbox for assessing stakeholder incentives in PFM (9), and other attempts to value non-market benefits have increased my scepticism of some of the non-market valuation methods in a tropical forestry context. The use of sophisticated economic methods, which

often forms part of a doctorate, can disguise faulty data and a weak understanding of physical relationships. And they are usually too expensive to apply in tropical forestry situations where budgets and time are limited.

While contingent valuation methods can have an important role in valuing some ecological services, they tend to work better when the benefit or service is relatively homogenous and well understood (e.g., clean water). My experience has been that they work less well in a tropical forestry context. For local forest users, the construction of hypothetical scenarios necessary for contingent valuation can be confusing, is sometimes unethical and probably results in erroneous numbers. From a policy perspective, it is probably more reliable to get the primary stakeholders to rank the importance of non-market benefits rather than attempt to place financial values on them.

2.6 Common property regimes and indigenous forest management in Latin America (Publications 6a and 6b)

Richards, M. (1997) Common Property Resource Institutions and Forest Management in Latin America. *Development and Change* 28 (1): 95-117

Richards, M. (2006). Institutional and Economic Issues in the Promotion of Commercial Forest Management in Amerindian Societies. pp.181-192. In Posey, D.A. and Balick, M.J., eds. *Human Impacts on Amazonia. The Role of Traditional Ecological Knowledge in Conservation and Development.* New York: Columbia University Press

2.6.1 Context

Over the 1994-1996 period I was involved in a major research study for the UK ODA Rural Resources and Poverty Research Programme. My task was to assess forest sector institutional change in Latin America. This involved various inter-connected studies, including an analysis of changes in national forestry authorities (unpublished ODI paper); decentralisation and privatisation

policies in Mexico and Costa Rica (Richards and Davies, 1996); a review of technical, policy and institutional issues in colonisation zones (see 2.7); and an assessment of common property resource or regime (CPR) institutions, the subject of these two papers and an ODI briefing paper (Richards, 1997).

Over this period I was also involved in several ODA project cycle missions and other consultancies which allowed me to complement my reading of the literature with field observations. These included consultancies to the Brazilian Amazon, mainly in Pará State, a project design mission focusing on protected area management in the Bolivian Amazon, and a mid-term review of a project to develop sustainable livelihood options for colonist farmers, also in Pará State.

The second book chapter version (6b) derives from a presentation I gave at a 1998 Conference entitled 'Human Impacts on the Environments of Brazilian Amazonia: Does Traditional Ecological Knowledge have a Role in the Future of the Region?' This was organised by the Centre for Brazilian Studies, University of Oxford. The long delay in publication of selected Conference papers was due to the untimely death of Professor Darrell Posey, the Conference director and main editor of the planned book, in 2001. It was only in 2004 that it was decided to recommence the process of editing and publishing selected Conference papers.

2.6.2 Methods

The papers were based on an extensive published and grey literature review, combined with observations from field assignments in Latin America from 1991 to 1996. They also drew on insights from my earlier research, including that associated with Publications 1, 2 and 4. The later book chapter version also benefited from research undertaken for Publications 7 and 8.

2.6.3 Originality

I regard the *Development and Change* article as my most original and important paper. While there was an extensive literature on common property resource (CPR) issues, little of it (at least in English) focused on natural

resource management in Latin America. It therefore filled a gap in the literature. While not original, my analysis of the implications of the clash between indigenous and market economic incentives has been seen as significant by some observers, since it highlights the dangers of a market-led approach to SFM and conservation for indigenous groups. For example, it was cited by Dr David Kaimowitz, then Director General of the Centre for International Forestry Research (CIFOR), in his keynote presentation at the 2004 International Association for the Study of Common Property (IASCP) Conference (see Appendix 3).

The book chapter particularly focuses on the appropriateness and viability of European models of 'classical forest management', involving sustained yield silvicultural and management practices. This model has been promoted in various parts of Latin America by donors and international NGOs. This paper points out the links between institutional uncertainty, risk and the economic viability of market-based forest management for indigenous groups. As well as the clash of indigenous and market incentives, other risk factors include a lack of market and technical information, pressures to adopt unfamiliar administrative and organisational procedures, and international market volatility for forest products, especially NTFPs. Higher risk translates into higher discount rates, and this directly reduces the viability of SFM, as do the often high transaction costs of PFM projects. It is therefore unsurprising that there are few enduring examples of 'classical' timber-oriented forest management by Amerindian groups, except where there is continuing donor or international NGO support.

2.6.4 Learning

The main contribution of these two papers was to highlight the clash between traditional and market incentives for CPR-based PFM in Amerindian societies. The essence of this clash is that market economy incentives, based on concepts like profit maximisation and competitiveness, tend to jar with indigenous economic systems based on cosmological world views and reciprocity. A key objective of indigenous resource management systems is to make gifts and maintain reciprocity, and it is sometimes considered anti-social

to accumulate wealth. Market transactions erode such beliefs, remove traditional checks on extractive practices and break down the 'gift economy' at the heart of CPR management. An intergenerational clash has also been observed.

This leads to a questioning of the assumptions behind some donor and state policies, including market-led PFM and resource privatisation. For example, the neo-liberal rationale for privatising CPRs (now less popular than in the 1990s) came from the conclusion that CPR systems were being eroded by commercial and demographic pressures *per se*, and that this was inevitable due to 'free-riding' problems. But this stemmed from an erroneous interpretation of Hardin's (1968) 'tragedy of the commons' thesis – it was erroneous because it insufficiently distinguished between CPR and open access regimes.

My paper reveals a more complex picture of CPR erosion: the consistent evidence is that this has been induced by external policy and institutional factors *combined with* commercial and demographic pressures. There are also many examples of CPR institutions responding positively to market pressures or opportunities. It is logical that if state policies and legislation are key to the erosion of CPRs, they can help strengthen them. But the failure to properly research and explain these processes has led to resource privatisation and negative environmental and equity outcomes. Thus for some observers it is more accurate to talk about the 'tragedy of the non-commons'.

It is not just the clash of traditional and market incentives which is problematic when indigenous groups with CPR regimes adopt a market-oriented strategy, and especially if they try to access international markets. Other problems include the volatile nature of international commodity markets, especially of NTFPs (see 2.2), the difficulty of meeting quality and quantity (continuity) demands and the need for new administrative systems. The paper also reaffirmed my conviction (as in Publications 1 and 2) of the need for a more holistic livelihoods perspective when promoting PFM. This research also helped me understand a flaw in the 'market logic' that a forest is more likely to

survive when it is 'given value by the market'. In particular market-based strategies overlook the possibility that non-market values provide stronger conservation incentives. The book chapter version goes further by suggesting that, in view of the risks involved in market-based SFM, there is an ethical question to donors and international NGOs that encourage indigenous societies down this route.

This analysis therefore made me interested in exploring 'alternative' or non-market approaches to conservation that are more based on an indigenous reciprocity-based logic. This could involve, for example, donor and state support for indigenous rights, political institutions and social infrastructure (health, education, etc.) in exchange for a commitment to conservation, openness to scientific research and some recreational or tourism access (as in the case of one long-running EC project in the Colombian Amazon). But such approaches do not sit easily with neo-liberal policies and political economy realities.

2.6.5 Postscript

CPR-based forestry in Latin America has endured in various forms, for example, in Mexico (forest *ejidos*), Brazil (extractive reserves), Guatemala (community concessions) and Colombia (indigenous reserves), although not without considerable donor support. This shows that indigenous CPR regimes are capable of survival with appropriate support and policies, especially in the area of property rights. Other sources also suggest that underlying incentives are different for local and especially indigenous communities. For example, a recent World Bank study observes that *ceteris paribus* indigenous forest ownership is associated with significantly lower deforestation; possible explanations include that "indigenous people place a higher value on conservation than outside colonists, use more benign and appropriate technologies for land and forest management, or have less contact with markets" (Chomitz et al., 2006: 172). Scherr et al. (2004a) also observe that indigenous forest managers usually harvest less than the legal allowable cut.

Official agencies and some governments are now more supportive of CPR systems as a means of achieving conservation and welfare objectives. This is reflected by the trend towards devolution of control to indigenous and other communities over forest resources – the area of developing country forests owned or administered by communities doubled from 1990 to 2005 to about a quarter of the total forest area in developing countries (Molnar et al., 2004). The latter source also reported a study comparing 80 indigenous reserves and 19 state-funded protected areas in Amazonia, showing that the former were much more cost-effective in achieving conservation outcomes.

With the increased awareness of the social and environmental costs of resource privatisation, and of the inefficiency (high cost) of the 'fences and fines' approach, there is growing support for indigenous conservation strategies (Molnar et al., 2004). For the future, it is essential to monitor and assess how indigenous institutions and incentives respond to emerging PES markets, and to provide the necessary legal, judicial, technical and institutional support for equitable and sustainable outcomes.

2.7 Stabilising the Amazon frontier (Publication 7)

Richards, M. (1997) *Missing a Moving Target? Technological Change on the Amazon Frontier*. ODI Research Study. Overseas Development Institute, London

2.7.1 Context

This book and an ODI briefing paper (Richards, 1996) emerged from the same ODA research study as Publication 6. It addresses forest conservation in terms of how to slow the advance of the agricultural frontier, while recognising that colonist farming is not an underlying cause of deforestation (Contreras-Hermosilla, 2000). There was strong interest in this theme in the 1990s in view of the perceived win-win potential of colonist stabilisation programmes. For example, the G-7 'Pilot Programme to Conserve the Brazilian Rain Forest', which is still ongoing, has received major support from

multilateral (especially the EC) and bilateral donors; another major initiative was the UNDP 'Alternatives to Slash and Burn' Amazon research programme.

This publication was also informed by my visits to colonisation areas in Brazil and Bolivia, already mentioned in 2.6.1. I also supervised a case study of colonist farmer organisation and agroforestry, the *Reflorestamento Economico Consorcionado e Adensado* (RECA) project, Acre State, Brazil in 1994 (4). The book also built on my understanding developed in Publications 4 and 6.

2.7.2 Methods

The book is based on an extensive published and grey literature review, including many programme and project reports, and personal observations from fieldwork in colonisation zones in Brazil and Bolivia. During these visits I held many informal interviews with Brazilian and Bolivian farmers, NGO and state project staff, extension workers, researchers and policy makers.

2.7.3 Originality

This book aimed to better understand technological, institutional and policy options for stabilising colonist farmers in Latin America, especially in the Amazon region. Its use of a micro-economic incentives framework to assess the constraints and potential for land use change at the frontier was probably not original, but it was atypical of most colonisation zone literature. The book explains the rationality and dynamics of colonist farmer decision-making in response to changing relative resource scarcity in a 'maturing' frontier, an evolving institutional and policy framework, and in pursuance of a colonist goal of accumulating sufficient capital to live closer to social infrastructure.

The book argues that stabilisation programmes have largely ignored or misunderstood colonist farmer incentives, and been driven by technologically-based approaches in which the aim has been to intensify land use on suitable soil types. They therefore 'missed a moving target' and had disappointing impacts. As pointed out by Dr Katrina Brown (University of East Anglia) in her review of the book (Appendix 3):

'One conclusion is that "policy and institutionally-based approaches are likely to be more cost-effective at influencing land-use practices than technologically-based approaches, because land use practices are a response to prevailing farm-level incentives, rather than the relative availability of different sorts of technology" (p.69). Does this constitute a radical shift in the emphasis of current development projects in the region I wonder?' (Brown 1998:156).

2.7.4 Learning

The assumption is made at the outset that colonist farmers are rational decision-makers in the use of their scarce family resources (labour, capital and land) to achieve a less precarious life for their families. It is observed that the relative scarcity of these resources or production factors changes as the frontier evolves, the literature having identified three main stages of frontier development:

- the 'early pioneer' stage, when the forest is still fairly intact;
- the 'emerging market economy' stage when most abandonment occurs;
- the 'closing frontier' stage when agriculture and ranching are dominant.

Appropriate farm or forest management practices and polices aim at a 'moving target' in terms of the evolving frontier and relative factor scarcity. For example, over time land becomes more scarce and expensive, while the availability of capital and family labour gradually increases (e.g., families are usually smaller in the early pioneer stage). As the frontier ages, there is evolving tenure security, state and NGO presence, extension and credit support, social infrastructure development, etc.

But most colonist stabilisation programme have seen the main challenge to be how to match intensive agricultural technologies with the soil conditions in order to raise land productivity. Land intensification however requires more labour, capital (or credit), tenure security, agricultural extension and market access, and is therefore not feasible at the early pioneer stage. The labour constraint to intensification was particularly underestimated.

Intensification becomes more feasible when family size and land values rise, there is state/NGO support for tenure, credit and extension services, nearby markets for farm products and risks fall (risk is a major determinant of colonist decision-making). On the other hand, a constraint to more intensive land use at the later frontier stage is reduced soil fertility. These factors place a premium on soil-improving technologies, like cover crops, that simultaneously increase the returns to land and labour. In the later frontier stage, resource-intensive agroforestry and perennial crop options, as well as secondary forest management, become more viable livelihood strategies.

Also any stabilisation strategy needs to factor in the capital accumulation objectives of colonists. The main colonist strategy is to buy (or colonise) cheap forest land and sell it (deforested) to other small farmers or cattle ranchers. And in the absence of a banking system, cattle are a very convenient means of storing capital. They are particularly attractive when land is abundant and labour scarce (as in the early pioneer stage). The main constraint to cattle farming is capital availability. Therefore either raising agricultural productivity or providing credit tends to accelerate deforestation since it enables colonists to buy cattle, thereby making the 'deforestation cycle' more profitable and speeding up the whole process.

In terms of the overall research hypothesis, a key learning point was understanding the economic and social opportunity costs[5] of 'sustainable' land use options. In (economic) theory, each colonist farmer has a switchover point when a decision is made to move from an existing piece of land to a new plot, and this is determined by the relative profitability of the two pieces of land. In order to reduce the opportunity cost of staying on the first plot, the priorities should be, on the one hand, secure land tenure and encouragement of local support organisations (e.g., local NGOs supplying agricultural extension, credit and marketing services), and on the other hand, policy measures to reduce the attractiveness of cattle farming and other non-sustainable land use

options (e.g., differential land use taxation has been tried in Brazil). A 'pro-poor' strategy would be the provision of education[6] and health services at the early pioneer phase, since this reduces the desire to move on.

But strategies which reduce the opportunity costs of colonist stabilisation also increase the 'pull' of the frontier. It is therefore important to improve employment opportunities and social services in colonist origin areas (e.g., Northeast Brazil). This brings us back to the underlying causes of frontier colonisation; what happens at the frontier depends on social and economic conditions in the rest of the economy.

The book also discusses the potential for PFM. This appears to be highest at the early pioneer stage since the forest is more intact, and it is less labour and capital intensive than farming options. For colonists, PFM for timber is more likely than for NTFPs, since the former is less knowledge and labour intensive; also low returns to labour from NTFP extraction makes it unattractive. On the other hand, timber-based PFM is more demanding in terms of institutional, tenure and marketing support, which is scarce during the early pioneer phase, colonists are not naturally inclined to form cooperative institutions, and in frontier areas the plentiful supply of clearance timber depresses prices. The predominant view among colonists, in contrast to indigenous groups, is that forests are land reserves for conversion. Also colonists tend to prefer more open landscapes. There are therefore few cases of PFM involving colonist farmers.

2.7.5 Postscript

Two subsequent studies of frontier deforestation show an even more complex situation than presented in 'Missing a Moving Target'. An econometric study of deforestation on Ecuador's Amazon frontier by Wunder (2000) and a major

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[5] The opportunity cost can be defined here as the net income foregone as a result of not pursuing the most viable alternative land use.

[6] The forest conservation impacts of education in the Bolivian Amazon have been studied by Godoy and Contreras (2001). Since 1987, the author has been involved in a successful and rapidly expanding rural education programme in Honduras oriented to sustainable livelihoods, including in areas near Rio Platano Biosphere Reserve (4).

review by Angelsen & Kaimowitz (2001) show that any change in productivity, relative factor cost or product price can have unforeseen impacts depending on the combination of a range of forest and extra-sectoral factors. They show the danger of labour-saving agricultural technologies that result in surplus labour being invested in forest degrading activities. The prime example is 'push-factor' colonisation resulting from mechanised soybean cultivation in Bolivia and Brazil, which has grown from almost zero in 1970 to 117,000 square kilometers by 2006 (Chomitz et al., 2006). Secondly, R&D in agricultural productivity *ceteris paribus* increases the profitability gap with SFM, and therefore increases the profitability of the colonist's deforestation cycle (as do new roads). But if a productivity improvement leads to increased wages, this can increase the opportunity cost of forest degrading activities and slow deforestation. Thirdly, when the labour supply to frontier areas is elastic (i.e., labour is available to take up new employment opportunities), any project or development near the frontier increases frontier pull.

These books have led me to a revised view that the only safe technological option is more labour-intensive agriculture well away from the frontier, and ideally in colonist origin areas. In fact almost any frontier technological, policy or institutional initiative is risky in that it is likely to increase the frontier pull factor. Poverty considerations however make this an indefensible policy stance. This research again shows that win-win outcomes from forestry based projects or policies are elusive; they are more likely to happen from less visible 'extra-sectoral' actions, e.g., improvement of employment and social conditions in colonist source areas. However Brazil is developing a promising market-based approach to frontier conservation through its system of 'Transferable Forest Protection Obligations' (Chomitz et al., 2006:181-182). This is a 'cap and trade' system in which landowners with less than the legal minimum (20 per cent in Southern states and 80 per cent in 'Legal Amazonia') of their landholding under forest pay the opportunity cost of conservation of landholders with more than the legal minimum. There is therefore a strong incentive for landowners to increase their forest areas.

A theme not covered in my book is the increasing evidence of natural 'forest transition' in many colonisation zones (Rudel et al, 2005). This is when deforestation results in a scarcity of wood and other forest products, causing prices to rise and resulting in secondary forest regrowth on abandoned farmland, especially pasture. This has occurred on a relatively modest scale in the Amazon region compared to Asia, where considerable environmental and livelihood benefits are reported (Mather, 2007). Finally as a footnote to the observation that there are few cases of colonist farmers undertaking PFM, in the Bolivian case study associated with Publication 9, a group of colonist farmers abandoned PFM once their objective of secure property rights had been achieved.

2.8 Innovative incentive mechanisms for SFM (Publication 8)

Richards, M. (2000) Can Sustainable Tropical Forestry be Made Profitable? The Potential and Limitations of Innovative Incentive Mechanisms. *World Development* 28 (6): 1001-1016

2.8.1 Context

From 1997 to 1999 the ODI forestry group received a major grant from the European Commission to assess EU tropical forestry aid policies. Under this grant, I was asked to review the potential of 'innovative financing and incentive mechanisms' for SFM and conservation. This resulted in a joint ODI/EC paper entitled 'Internalising the Externalities of Tropical Forestry: A Review of Innovative Financing and Incentive Mechanisms' (Richards, 1999). The *World Development* paper and an ODI briefing paper (Richards and Moura Costa, 1999) were drawn from the longer report. This review paper also provided me with an opportunity to synthesise my understanding at the time of the role of economic incentives in SFM and conservation.

2.8.2 Methods

This paper was based mainly on an extensive literature review, supported by field observations on the progress of SFM and conservation in Latin America and Ghana.

2.8.3 Originality

Since this paper was based on a literature review its originality is limited, but I think it made a significant contribution to the literature. The longer version of the paper was distributed to all participants of the United Nations Forum for Forest (UNFF) Inter-Sessional Workshop on Financing of Sustainable Forest Management (11-13 October 1999, London). I think a contribution of the paper was to help clarify some of the issues through a clear structure, including its classification of innovative incentive mechanisms (IIMs) and the criteria used for assessing their potential. The IIMs were classified into three main approaches:

- Non-market based transfer payments (sub-divided into domestic and international mechanisms);
- Market-based approaches;
- Property rights approaches.

This classification has been used by subsequent authors, like Verweij (2002). The criteria for assessing the potential of IIMs, more apparent in the longer paper (Richards, 1999), were:

- the extent to which they tackle policy and market failures;
- whether they are market-based and therefore 'internalise' the externalities;
- the capacity and willingness to pay of beneficiaries;
- the level of political will needed to implement them;
- their technical and administrative complexity.

I also think that Table 2 of the paper (p.1012) was a useful adaptation of a table that first appeared in Lampietti and Dixon (1995). This is a matrix showing the distribution of benefits from different forest types between local, corporate, national and global stakeholders. This is helpful for thinking about the capacity and willingness of different stakeholders to pay for different types of benefits. The paper was also progressive in arguing the logic of a 'global negotiating table' for SFM and conservation.

2.8.4 Learning

Building on Publication 7, a major personal learning point was the importance of 'extra-sectoral' policy drivers of deforestation. As already discussed, SFM is unlikely when there are easier and quicker profits from unregulated logging, ranching or unsustainable cash crops. These 'easy profits' are often due to new roads to forested areas, farm subsidies and other extra-sectoral policies. Another problem is land tenure legislation that encourages land speculation or clearance to establish property rights. The paper therefore argues that for SFM and conservation, extra-sectoral policies are at least as important as forest sector policies. Policy implications include promotion of off-farm employment, labour-intensive agriculture away from the frontier, and human and social capital formation in rural areas (Southgate, 1998). But the macroeconomic and social development imperatives behind 'extra-sectoral' policies, not to mention vested interests in the *status quo*, make it very difficult to influence these policies in favour of tropical forests. Also few studies have assessed the environmental costs of such policies.

Thus a major emphasis of the paper is on how to reduce the opportunity costs of SFM. It therefore stresses the interdependence of supply and demand measures in promoting SFM and conservation (building on most previous publications). Increased demand due to a policy measure, like removal of a log export ban, increases the stumpage or standing value of forests, and increases the returns to both SFM *and* illegal logging. But the problem for most tropical countries is the political will and administrative capacity needed for effective forest governance and regulation. Also the 1990s witnessed major 'state downsizing' imposed by structural adjustment policies.

The paper also stresses the need for global governance since international regulatory agreements create demand and 'willingness to pay' for the public good benefits of SFM and conservation. The Kyoto Protocol of the UN Climate Change Convention is the main example of this, although for tropical countries only planted trees are currently included. Biodiversity is another public good for which global governance holds the key to creating market-based PES mechanisms, like tradable development rights, which would compensate the

opportunity cost values. But the UN Convention for Biological Diversity has failed to develop a global regulatory approach since the public good values of biodiversity are less well understood and appreciated, as well as due to national sovereignty concerns.

The paper also found that fiscal market-based instruments have high potential for SFM since, like PES, they 'internalise the externalities', but that it is difficult to get the tax levels right and they can be administratively complex. This was also a problem for other IIMs like 'performance bonds'. Therefore, the paper argues, the emphasis should be firstly on improving the regulatory framework and influencing extra-sectoral policies, as well as promoting the global governance agenda. It is sometimes forgotten that effective regulations will 'internalise the externalities'. But all these measures face national and international political economy constraints so that few countries have made significant progress. Also in spite of the paper's title, it was found that many of the urgent measures were not particularly innovative.

2.8.5 Postscript

Since this paper was written, the main advances have been in PES and, to a lesser extent, forest governance. Recent years have seen the development of national PES programmes in Costa Rica and Mexico, the growth of voluntary carbon and biodiversity offset markets, and several programmes in Latin America involving watershed management payments to forest managers by downstream beneficiaries (Scherr et al., 2006). These PES mechanisms have been driven mainly by NGO-led pressures for corporate social responsibility, and the desire of 'green' individuals to minimise their carbon footprint, although companies are increasingly motivated by the realisation that stricter emission regulations and/or carbon taxes are on the agenda.

While tropical 'carbon forestry' is still marginalised in the Kyoto Protocol, there is currently (January 2007) considerable discussion about the potential for forest conservation – or what is known as 'avoided deforestation' (AD) or 'reduced emissions from deforestation and forest degradation (REDD) in the Kyoto discussions. The Stern Review reported that reducing deforestation,

which contributes at least 18 per cent of man-made carbon emissions, is a "highly cost-effective way of reducing greenhouse gas emissions and has the potential to offer significant reductions fairly quickly" (Stern, 2006:537). This cost-effectiveness stems from the observation that the land use opportunity cost of forest conservation[7] is often very low compared to the carbon storage value. The proponents of AD argue that although the reduction in carbon emissions might not be permanent, it would provide a vital 'breathing space' for technological and fiscal solutions to effect major reductions in industrial and energy emissions.

What is attractive to this observer is that AD involves national programmes to reduce the rate of deforestation, due to the 'leakage'[8] problem of individual projects. Thus AD will only happen by tackling the policy and governance failures driving deforestation; on the other hand it may not be cheap or equitable[9]. There is considerable discussion about whether AD should be included in the Clean Development Mechanism (CDM) of the Kyoto Protocol, so that industrialised countries are able to purchase AD credits to set against their emission targets. The main fear is that the carbon market will be flooded, resulting in a price that is too low for a range of carbon mitigation options. But another way of looking at this is that AD would enable stricter emission caps by industrialised countries since it would allow a simultaneous supply and demand increase. Other AD proposals include Brazil's proposal for AD payments by industrialised countries based on the average market value of carbon, and a separate market for forest credits (Dresner et al., 2006). There is insufficient space here to discuss various other complex issues and challenges for AD like the setting of baselines and potential perverse incentives, measurement and accounting methodologies, 'additionality',

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[7] This varies from a few dollars per hectare for extensive ranching to about $1,000 per hectare for mechanised soya cultivation or 'one-off' logging, while a tropical forest typically releases 500 tonnes of carbon dioxide (Chomitz et al., 2006). Assuming a market value of $10 per tonne of carbon dioxide, the forest carbon value would be at least five times more than the land use opportunity cost value.

[8] Leakage happens when reduced emissions from lower deforestation in one place are cancelled out by increased emissions from deforestation somewhere else.

[9] The equity impacts of climate change and its mitigation options are of particular interest, having researched this topic (Richards, 2003).

'impermanence', leakage and the complexities of the CDM which result in very high transaction costs, but which ensure 'environmental integrity' and a 'fungible', tradable commodity. The general view (Chomitz et al., 2006, Ebeling, 2006, Stern, 2006) seems to be that these challenges are surmountable if there is sufficient political will.

As regards other PES options, an important realisation is that if they are not market or regulatory-based, they tend not to be cost-effective. For example, in Mexico's system of payments for hydrological services it is reported that only 10 per cent of the money went to the 20 per cent most threatened forests (Chomitz et al., 2006). Most payments have gone to forests not at risk, and therefore have not achieved 'additionality'. Auctioning of PES would ensure better targeting and efficiency. By contrast, a new PES mechanism with a clear regulatory and market basis is Brazil's system of Transferable Forest Protection Obligations (see 2.7.5). This tradable development rights system could prove to be a prototype for other national or global regulatory-based PES programmes.

On the governance side, the main developments have been (a) the Forest Law Enforcement and Governance (FLEG) process, involving regional agreements to tackle forest crime, and (b) higher forest product import standards in Europe through state procurement policies which specify that only legal or certified timber will be used, and 'code of conduct' agreements by some timber trade importers (Fripp and Roby, 2006). Eight European countries had public timber procurement policies in place by September 2006. But most tropical countries still suffer from weak forestry institutions and ineffective regulation, even allowing for improved export sector performance in some Latin American countries like Brazil and Bolivia.

In sum, market, policy and institutional failure problems remain very serious, and the conclusions of my 2000 paper still seem valid. There are however promising developments in some mid-income countries in PES mechanisms, and 'compensated reduction' or AD has enormous potential if political agreement can be reached in the Climate Change Convention. As this extract

from a proposal for 'compensated reduction' of deforestation indicates, a more equitable 'global negotiating table' may be getting closer:

> "*Compensated reduction is a voluntary mechanism that offers tropical countries access to substantial market incentives for reducing emissions, while respecting their sovereignty in selecting means and investing returns. It is in essence a strategy for an equitable global distribution of the costs and benefits for reducing deforestation.*" (Santilli et al., 2005:273).

2.9 Economic stakeholder analysis of PFM (Publication 9)

Richards, M., Yaron, G. and Davies, J. (2003). *Stakeholder Incentives in Participatory Forest Management. A Manual for Economic Analysis*. London: ITDG Publishers

2.9.1 Context

The assumption has too often been made that local people will naturally participate in PFM projects, but in practice, participation has been patchy and often dependent on subsidies, resulting in problems when these are withdrawn. In the mid-1990s, UK ODA conducted an extensive review of its PFM projects. One of the findings was insufficient understanding of the incentives for local forest users to participate in PFM as opposed to other land use and livelihood options, and that this contributed to disappointing outcomes. Thus the review identified the "need for further exploration of the type and level of incentives necessary to secure involvement" and for "more rigorous use of economic methods, particularly as design tools. Policy makers and other stakeholders also need accurate assessments of who wins and who loses ... and what the costs and benefits are" (ODA, 1996: 20).

In response to this situation, I made a successful application to the DFID Forestry Research Programme (FRP) to investigate the potential of economic methods and tools to improve the analysis of stakeholder incentives in PFM. This book represents the main output of this research study, conducted mainly between 1998 and 2001.

2.9.2 Methods

The book was based on a combination of primary and secondary data collection in the five case studies of PFM situations in Bolivia, Ghana, Mexico, Nepal and Zimbabwe, and an extensive literature review. It should be noted that the aim of the case studies was to generate, within normal donor and project time frames, reliable and cost-effective economic data on PFM incentives. Due to the time and 'cost-effectiveness' constraints, there was therefore high reliance on the use of memory recall methods, especially household surveys, key informant interviews and PRA methods. This typically resulted in four to six weeks of fieldwork by small interdisciplinary teams of international and national consultants. This compares to many studies reported in the literature involving multiple year data collection, as is often the case in PhD studies.

2.9.3 Originality

The main original contribution was development of the 'Economic Stakeholder Analysis' (ESA) approach. This was developed as a practical, problem-focused and holistic framework for assessing local stakeholder incentives in PFM. The ESA framework is a useful contribution to 'livelihood economics' analysis, and has implications beyond the forestry sector. It comprises six main stages:

- ESA stage 1 characterises the stakeholders and their sub-groups, especially in terms of their needs and objectives, mainly using PRA methods;
- ESA stage 2 seeks a thorough understanding of the problem and decision-making context, also mainly using PRA methods;
- ESA stage 3 assesses the need for an economic study, and then identifies and physically quantifies the costs and benefits of PFM and alternative land use or livelihood options;
- ESA stage 4 investigates appropriate prices or values for the costs and benefits identified in ESA stage 3;

- ESA stage 5 involves an economic comparison of alternative land uses, including an analysis of risk factors; and,
- ESA stage 6 involves returning the data to the community, and the participatory monitoring of PFM.

The book is structured around these six stages with the country case studies providing examples of the methods used and challenges faced. Other innovative aspects of the book and research study were:

- the attempt in the case studies to develop 'participatory economic analysis' with the aim of increasing ownership of the analysis, and encouraging stakeholders to use the calculations to help them make land use decisions (as discussed below, this was only partially successful);
- the emphasis on appropriate sequencing and complementarity in the use of memory recall methods;
- a 'head to head' comparison of PRA and a household survey in the Zimbabwe case study (published in Richards et al, 1999);
- highlighting rather than glossing over common mistakes or pitfalls in economic studies;
- the attempt in some of the case studies to estimate the discount rates and transaction costs of forest users;
- development of an interactive website which allows the reader to practice using some of the tools presented in the book: www.odifpeg.org.uk/economicsofPFM/examples.htm
- the book's attempt to make natural resource economics more accessible to non-economists.

2.9.4 Learning

While we found considerable methodological guidance on the economic analysis of forestry, most of this was inappropriate for assessing the incentives for local forest users. In most texts, there was an emphasis on sophisticated data collection and analysis methods, leading to a perception that economic analysis is complex and inaccessible, and PhD economists are needed. There was also a bias in the literature towards policy analysis and the

use of environmental economics tools, with very few studies adopting a local forest user perspective. We therefore decided there was a need to make some basic economic tools accessible to national practitioners, many of whom are agricultural economists without a specialised training in natural resource economics. We also wanted to make natural resource economics accessible to a wider policy audience, although not with the idea of encouraging them to 'dabble' with the methods (since a little knowledge can be dangerous when applying economic tools).

One of the lessons was that there are limits to local participation in the processing and analysis of economic data, especially when local forest users are less numerate and literate. There is considerable scope for participation in ESA stages 1, 2, 3 and 6, but the valuation (ESA 4) and economic comparison (ESA 5) stages are less amenable to participatory methods; e.g., calculations involving discount rates have to be done on the computer; some valuation issues cannot easily be solved in the field; and computer processing of data to compute gross margins and/or discounted measures of project worth are normally necessary. A key problem is the time that local people can invest in this process. They are almost always busy, and without incentives or compensation it is difficult to expect them to give more than a few hours on two or three different days. Higher levels of participation are possible with computer literate villagers, as has happened in some Mexican CFEs. Economic studies are therefore likely to involve a mix of more and less participatory methods.

It was also found that participatory approaches to valuing non-market benefits, like 'contingent ranking', were unreliable. There is no obvious alternative to using more sophisticated non-market valuation methods like contingent valuation, although the time and budget are rarely sufficient for these. It also proved difficult to elicit the personal discount rates of forest users. Given the methodological difficulties, it is more sensible to use opportunity cost based discount rates, and undertake sensitivity analysis on the discount rate to see how alternative livelihood options compare. But use of the 'barter-exchange' method to value subsistence products proved more successful (see 2.10.3).

Another lesson was the relative reliability of different memory recall methods for different types of variables. For variables with little variation between households, like production inputs and transaction costs, PRA methods were reliable and cost-effective, at least from the researcher's perspective (PRA is time consuming from a community perspective). But when there is considerable inter-household variation as for production, income and NTFP labour data, PRA was unreliable and over estimated production and household income. But PRA work and key informant discussions can ensure a well designed household survey. The study therefore revealed a logical sequence in the use of memory call methods:

- PRA methods should be used first, especially in order to understand the forest and farming system, to define forest products and sources, and to explore risk, gender and temporal issues;
- In-depth key informant interviews for specialist products, and to generate enterprise or household gross margins;
- Household surveys, informed by PRA and key informant discussions, can be used for information needed on a household by household basis, or for variables likely to reflect high inter-household variability.

The country case studies revealed the following findings in terms of economic incentives for PFM (the Nepal case study is discussed in 2.10):

- the Bolivia case study assessed whether the management of small forest blocks by an organised group of colonist farmers was viable following favourable policy reforms. The main constraint to SFM was identified as low and fluctuating log prices due to weak regulation and abundant frontier timber, which also made illegal logging attractive to farmers. There were however some important non-market benefits: an approved forest management plan was an important step in obtaining land title, and thence higher land values. But the study found that once land title is obtained, SFM ceases to be an attractive land use option.
- the Ghana case study revealed how political economy factors and weak regulatory controls have dissuaded farmers from keeping timber trees on

their cocoa farms, in spite of a naturally complementary relationship: some high value timber trees are excellent shade trees. These disincentives stemmed from policy failures in terms of the farmers' tree tenure and rights, and inadequate compensation for logging damage (2.3.5);

- the Mexican 'forest *ejido'* case study revealed concerns about the biological and economic sustainability of forest management at current extraction rates: female groups were more pessimistic than the men about future harvest levels of mahogany and NTFPs. This case study also focused on timber processing costs. A problem for some *ejidos* is that the viability of timber-based forest management and processing has been exaggerated by over-estimates of mahogany trees in forest inventories, and underestimation of depreciation of the sawmill and equipment.
- the Zimbabwean case study was notable for a 'head to head' comparison between PRA methods and household surveys. This revealed major differences in data reliability and cost-effectiveness of data collection between the two research methods; it particularly cast doubts over the reliability of PRA for quantitative estimates. It showed that NTFP collection, and processing of baskets and wine from palm cultivation generated modest poverty-alleviating cash flows in the dry season when there was little or no agricultural income, and that this was an important coping strategy in drought years (Richards et al., 1999).

2.9.5 Postscript

The book is currently being edited and published in Spanish (in Mexico) and Chinese (in China). In both cases, regional case studies have been added. There is also evidence of some tools being adopted in current studies of PFM. For example, a major study of the poverty impacts of PFM funded by the Ford Foundation and CARE has incorporated some of our tools in its research methodology, which is being applied in 40 villages in Nepal, Kenya and Tanzania (Dr Kate Schreckenberg, personal communication).

The author also participated in an analysis of PFM in Himachal Pradesh, India in 2005; this study involved a cost-benefit analysis comparison between Joint

Forest Management (JFM) and control communities. It found that while JFM villages compared favourably with non-JFM villages in terms of the overall forest benefit flows, within the JFM communities they were skewed to wealthier villagers. As found in Nepal (see 2.10), livestock and land ownership were key to obtaining community forestry benefits.

2.10 Community forestry in Nepal (Publication 10)

Richards, M., Maharjan, M. & Kanel, K. (2003). Economics, Poverty and Transparency: Measuring Equity in Forest User Groups. *Journal of Forest and Livelihood* 3 (1): 91-104

2.10.1 Context

This paper presents the Nepal case study from the DFID research study on the economics of PFM (9). It is based on two micro-economic research studies carried out in the Middle Hills area of Nepal in 1999 and 2000. Previous evaluations of Nepal's community forestry programme had revealed that although it was environmentally successful (improved forest cover and condition), there were concerns about the equity impacts. Therefore the study developed a participatory methodology so that Forest User Groups could, with some external assistance, assess the distribution of community forestry benefits. The hope was that improved transparency of equity or poverty impacts would form the basis for community consultations leading to more favourable management rules for poorer households.

2.10.2 Methods

The first fieldwork phase took place in early 1999, and focused on five Forest User Groups. The main elements of the methodology were: a wealth ranking exercise in each Forest User Group to identify wealth-ranked stakeholder groups; PRA exercises to clarify and map the types and flows of forest products, understand the role of forestry in the household economy, and generate labour and activity calendars; a key informant approach to estimating production levels, income and costs; a 'barter game' approach to

identify unit values of subsistence forestry products; and discussion of the results in a plenary session with all the stakeholder groups.

In the second study, which took place in 2000 with a single Forest User Group, the main differences were that: (a) a household survey was used instead of key informants for calculating production and labour levels; (b) more attention and time was given to returning the data to the community in order to provide a basis for internal discussion (after the facilitators leave); and (c) more thought was given to identifying appropriate economic equity and gender indicators of community forestry. The calculations focused particularly on the economic return to labour from community forestry activities - mainly the collection of subsistence forest products like firewood, fodder and grass - enabling comparison with other livelihood options.

2.10.3 Originality

The main contribution of this paper was to show that a participatory approach to data collection and analysis can increase transparency of the equity impacts of community forestry. Correspondence with the second author (Appendix 3) revealed that the methodology has led to discussions in some Forest User Groups of the need for more equitable forest management rules. The study was important for some of the methodological issues, including limitations of participatory economic analysis, appropriate sequencing of memory recall methods and the tendency of over-estimation of forest production and income from group-based estimates.

It also showed the potential of an innovative participatory valuation method called the 'barter exchange' approach; there are very few published examples of this variant of a contingent valuation method. The barter exchange method involves a simulated village market situation in which community members barter a well-known household commodity (maize in this case) for forest products of uncertain market value. Its attraction is that unlike other contingent valuation methods it does not rely on a hypothetical or abstract market situation. In spite of this, the barter game resulted in some over-estimation of values (possible reasons for this are discussed in the paper). Finally, the

paper was perhaps innovative in suggesting the use of 'economic equity' monitoring indicators for PFM, including gender-based indicators.

2.10.4 Learning

Apart from the methodological issues, the paper contributed to a better understanding of the equity impacts of community forestry. In the mid-hill areas of Nepal, forests are key to the welfare of the poor since they provide essential inputs to the farm and household economy like firewood, fodder and grass. Forest type or species is critical in determining the relative balance of market and subsistence benefits, and therefore the incentives for SFM. Pine forests are inferior to broadleaf forests for livestock inputs, but for poorer households with few or no cattle they were more valuable due to the cash opportunities from the sale of firewood, resin and poles.

While it might be expected that 'less poor' families with more on-farm tree resources were less dependent on community forestry, in practice they were more dependent than poorer families. This was because the latter relied more on off-farm income earning opportunities, and exerted less demand for livestock and manure inputs due to having less animals and land. Livestock ownership was the key to agricultural productivity via the use of manure and draft animals, as well as to better family nutrition. Landless or land-poor families were better off under the old 'open access' regime since they could obtain free grazing and firewood (albeit unsustainably). In addition it was the less poor who sat on the Forest User Group Committees, and who thus decided on forest management rules and choice of species. These often involved a trade-off between the subsistence benefits and longer term benefits associated with timber production. Better-off families can more easily afford to forgo PFM products due to their alternative sources of fodder, grass, grazing and firewood, and lower personal discount rates.

While not new, the paper confirmed that where forest product markets are weak or absent, the interdependence of forests, livestock and crops can result in strong incentives for SFM. In this situation, tenure security and strong CPR institutions are key drivers of SFM. But weak or absent markets limit the

options for the resource poor. The study revealed that the main poverty alleviation options were: (a) to help poorer households obtain livestock and farmland; (b) modifications of Forest User Group rules to allow the poor to sell community forest products like firewood and poles; and (c) promotion of off-farm/forest employment options.

2.10.5 Postscript

A recent economic analysis of the benefits of community forestry in Nepal (Adhikari et al., 2004) reports almost identical conclusions. Based on an intensive and longitudinal research methodology, it found that wealthier households benefited more than poorer households as a result of their land and livestock holdings, as well as due to caste and education factors.

2.11 Illegal logging in Central America (Publication 11)

Richards, M., Wells, A., Del Gatto, F., Contreras-Hermosilla, A. and Pommier, D. (2003). Impacts of illegality and barriers to legality: a diagnostic analysis of illegal logging in Honduras and Nicaragua. ***International Forestry Review*** **5 (3): 282-291**

2.11.1 Context

After the 'economics of PFM' study, my next main research study was on the causes and impacts of illegal logging in Central America, following successful proposals to DFID and the World Bank. This aimed to identify the causes, dynamics and consequences of illegal logging in Honduras and Nicaragua. I undertook this partly as an ODI Research Associate, having left ODI at the end of 2001.

2.11.2 Methods

The paper is based on primary data collection and analysis. The large research team carried out six case studies in illegal logging hotspots, three in each country. The main field research method was semi-structured interviews with key informants, including local people involved in illegal logging, loggers and local government officials. Interviews were also held with national forestry

industry representatives, senior staff of the state forestry authorities, and forest sector consultants. We also analysed official national forest production and import/export data, as well as regional trade data (to the extent this existed), and held multi-stakeholder national workshops to discuss the findings and develop a consensus for remedial action.

2.11.3 Originality

This was one of the first empirical attempts to assess the impacts of illegal logging, as opposed to the many anecdotal and rather qualitative accounts. A systematic analysis of the economic, governance, social (poverty) and environmental impacts of illegal logging was undertaken. An innovative aspect of the study was the attempt to estimate the cost of illegal logging to each national economy, especially the loss of fiscal revenue and the opportunity cost of wasted expenditure on SFM. There was also an indicative estimate of the environmental costs of illegal logging. The aim of these calculations was to make the case for remedial action.

An important contribution of the paper was the classification of timber into three categories: 'legal', 'legalised' and 'clandestine' timber production. Previous studies had lumped the latter two categories together as illegal timber. 'Legalised production' refers to the fraudulent legalisation of timber production by corrupt officials so that it enters into official statistics as if it were legal, while 'clandestine production' is not documented and evades official fees and taxes. Both legalised and clandestine production involve bribery and corruption, since payments are made by illegal loggers either to obtain false documents or for officials to 'turn a blind eye'. Local experts in both countries estimated that most official production was 'legalised'.

Another innovative aspect of the paper was the analysis of transboundary timber movements. This revealed major inconsistencies between export and import data in the region, partly due to the significant illegal cross-border trade. It was concluded that both countries were substantially under-declaring their timber exports.

2.11.4 Learning

This study reinforced my understanding of the role of forest governance and the regulatory framework. Failure to control illegal logging combined with over-regulation had created an unlevel market playing field and raised the opportunity costs of (legal) SFM. The weak regulatory and governance environments caused various disincentives for SFM. An excess timber supply situation depressed market prices, and legal operators suffered from high transaction costs, both due to the excessive regulations resulting in numerous fiscal charges, and from having to pay corrupt state officials 'informal payments' even when all the papers were in order. Meanwhile illegal loggers benefited from low penalties and weak enforcement. These and other factors were 'barriers to legality' and encouraged forest crime.

CFEs were found to be especially vulnerable to the effects of weak and corrupt forestry authorities; e.g., in Honduras, one case study revealed that loggers had bought their way into CFEs in order to obtain cutting permits. This infiltration caused community divisions, rival factions between 'bought' and law-abiding citizens, and an increase in violence. Two Honduran CFEs lost their certification status as a result of the illegalities perpetrated mainly by outsiders. In addition, the case studies showed that illegal logging had negative impacts on sustainable livelihoods due to the erosion of social and natural capital. Any employment by loggers was poorly remunerated, and gains in financial capital were thin and temporary. Another example of how institutional weaknesses impinged on SFM objectives was that the national forestry authorities were financially dependent on forest revenue, especially in Nicaragua. This resulted in the issue of felling permits beyond the allowable cut. In Nicaragua, there was evidence of agreements between the Forest Service, local governments and community leaders to 'legalise' over-production.

Key remedies to these problems include administrative and legal rationalisation and simplification, heavier fines and better enforcement,

increased transparency and accountability (including through the involvement of NGOs, community groups and local government in monitoring logging activities), increased rights and tenure security for CFEs, depoliticising the election of senior forestry officials, reduced dependence of state forestry agencies on forest revenue and the development of PES mechanisms.

It was also found that better control of illegal logging in one country is unlikely to reduce overall illegal timber flows if there is no change in forest governance in neighbouring countries. The problem is 'displacement' or 'leakage': when illegal logging comes under control in one country, the demand for cheap timber remains and sucks in illegal imports from elsewhere. For example, Costa Rica claimed to have a much lower level of illegal logging than its neighbours, but imported large quantities of clandestine timber from Nicaragua, most of it across the San Juan river which borders the two countries (the author crossed this thinly patrolled border in 1997).

My conclusion of the study in terms of incentives for SFM is that forest governance (or the lack of it) is the most important determinant of SFM, since regulatory failures and corruption result in high costs of legal production and depress market prices. We therefore found that the "legal, regulatory and institutional framework creates strong incentives to break or avoid the law" (290). Improved forest law enforcement will only emerge through concerted political mobilisation and action by a range of stakeholders, both internal and external. The biggest hurdle is the political will to control illegal logging and other forms of forest crime.

2.11.5 Postscript

For the Honduras based co-author, this study was key in making illegal logging a major political issue (Filippo Del Gatto, personal communication). The estimates of illegal timber flows and costs to the economy have been regularly cited in the national press as well as in regional scientific publications. The study led to an ongoing (2005-07) project to increase transparency in Honduras' forest sector involving Global Witness and the National Commission of Human Rights. Another important influence has been

the Environmental Movement of Olancho, a popular activism movement against illegal logging and corruption involving Catholic priests, communities and local governments. These pressures led to a commitment at the end of 2005 by the new President of Honduras to commit 1 per cent of national income to forest protection and reforestation. At the regional level, the Central American Commission for Environment and Development (CCAD) has commissioned a study of regional timber trade flows to be carried out by the Tropical Agricultural Research and Teaching Centre (CATIE). This will feed into the Central American Forest Law Enforcement and Governance (FLEG) meeting proposed for 2007.

The study has also been incorporated into two CIFOR books (Colchester et al., 2006, and Tacconi, 2007). This book makes the important point that before being enforced, forest and extra-sectoral legislation needs to be equitable. For example, it should recognise customary tenure and access rights. Inequitable legislation and biased administrative and judiciary systems reinforce social and legal biases against forest communities, and cause negative livelihood impacts. This is a warning against 'fast track' approaches to forest law enforcement. I was able to contribute my learning from the Central American study at a 2004 FAO/ITTO workshop on best practices in forest governance and law enforcement (FAO/ITTO, 2005).

2.12 Forest trade and governance (Publication 12)

Richards, M. (2004). Forest trade policies – how do they affect forest governance? *Unasylva 219*: 39-43

2.12.1 Context

In 2002 I was commissioned by IIED to review the impacts of international forest trade policies on forest governance. This was part of a larger study for the UN Food and Agriculture Organization (FAO) on the effects of international trade on SFM. For this study, I drew particularly on my work on illegal logging in Central America (Publication 11), on innovative incentives for SFM (8) and on my earlier work for IIED in Ghana (3). The short paper for the

FAO forestry journal *Unasylva* was drawn from a longer paper 'Higher international standards or race to the bottom? The impacts of forest product trade liberalisation on forest governance'. I presented this at an FAO 'Expert Consultation on Trade and Sustainable Forest Management - Impacts and Interactions' in Rome, 3-5 February 2003: http://www.fao.org/forestry/foris/data/trade/pdf/richard.pdf

2.12.2 Methods

This research study, which took place over about a year, involved an extensive review of the forest trade and governance literature, and a mix of primary and secondary data collection and analysis from case studies in Brazil, Indonesia and Mexico. The Brazil and Indonesia studies were carried out by experienced consultants working under my supervision, while I undertook the Mexican study. The primary data derived mainly from discussions with key informants and stakeholders involved in logging and forest governance, including community and industrial forestry representatives, senior government officials, international and local NGOs, and academics (e.g., Dr David Bray, University of Florida).

2.12.3 Original contribution

This was an original piece of research in that, while various studies have touched on these issues (e.g., effects of trade policies on SFM), none had specifically examined the relationship between international trade policies and forest governance. A key contribution of the paper was to trace through the effects of forest trade policies on the incentives of different stakeholders (especially forest managers or companies, forestry department staff, senior civil servants and politicians) to either pursue rent-seeking options or to operate legally.

The paper examined the relationship between trade policies and forest governance both in theory and practice, and brought together a wide range of literature. This included literature on neo-classical economic theory which tends to favour positive governance impacts from trade liberalisation, on international trade and environmental governance interactions, and on the

drivers of corruption. The case studies allowed an empirical analysis of the relationship between trade policies and forest governance in three very different contexts in terms of the trade policies, forest governance, and the political and macro-economic context.

2.12.4 Learning

The main finding was that trade policies have weak, indirect and often unintended impacts on forest governance. This is because they interact with other policies and pressures that have a more direct influence on forest governance. Forest governance was found to be more dependent on macroeconomic and political factors like economic development, political stability and democratic progress. Indonesia, with rampant corruption and illegal logging, was locked into a downward development and governance spiral, exacerbated by economic and political instability. Brazil and Mexico, on the other hand, were on an upwards economic and political (e.g., increased space for civil society) trajectory, and were making better forest governance progress, at least in their export sectors.

Economic development seems to reduce the 'resource curse' governance problems of countries that are well-endowed with forests and other natural resources, and which rely on mining these resources for their economic development. The 'curse' is that this natural wealth is often associated with strong vested interests and poor macroeconomic management. There is also an apparent 'environmental Kuznets curve' for forestry[10], although the evidence is clearer in Latin America than in Asia and Africa, mainly because most developing countries have not reached the threshold income level at which deforestation is expected to fall (Kaimowitz and Angelsen, 2001).

Whether higher producer prices due to trade liberalisation encourage better governance depends primarily on the effectiveness of the governance and regulatory framework. Without effective regulation, higher prices encourage

[10] According to the environmental Kuznets curve, the environment firstly worsens with rising income or economic development, but then improves after a threshold level of income or development is reached.

unsustainable logging, which depresses domestic prices and discourages SFM. Freer trade can also encourage lower cost production through non-compliance in order to remain competitive. However, where the regulatory framework is stronger, freer trade should encourage SFM.

It was also found that incentives stemming from trade policies magnify or reinforce existing forest governance trends. Thus where forest governance is weak, either trade liberalisation or protection tends to exacerbate the problems. For example, a deregulatory forest law in Mexico prior to NAFTA in 1994 caused a big increase in illegal logging. In Brazil, improving forest governance standards in the export sector have received a boost from trade liberalisation and certification. But this may have been at the expense of governance standards in the much larger domestic sector, which is less subject to international scrutiny, but more prone to forest governance problems (a common finding of the three case studies). The paper also notes that agricultural trade liberalisation has had a bigger impact on forest governance; e.g., freer trade for soybean has caused massive illegal forest clearance in the Amazon. State incentives for oil palm plantations in Indonesia have had the same effect.

It was easier to substantiate negative governance effects from trade restrictions than to show positive governance effects from trade liberalisation. Log and lumber export bans protect domestic forest industry by depressing domestic log prices, and this results in industrial over-capacity, which in turn increases illegal logging pressures since the legal cut is insufficient to satisfy demand. Indonesia is the classic historical example of this (Gillis and Repetto, 1988). Depending on the mix of political and economic factors, trade liberalisation reduces rent-seeking incentives for some stakeholders, but increases them for others.

Another finding was the way that trade facilitates the cross-border transfer of governance problems (as found in Publication 11). When a country improves its forest governance (e.g., Malaysia) or introduces a logging ban (e.g., China), this increases demand pressures and illegal logging in weaker

governance neighbours (e.g., Indonesia). This shows the importance of a regional forest governance approach, as in the FLEG process. Another lesson was the sequencing of freer trade and governance improvements: as noted by Stiglitz (1998), governance quality is key to trade liberalisation outcomes. Therefore institutions and regulatory frameworks need to be strengthened before rather than after trade liberalisation. But with the structural adjustment programmes of the 1990s, the tendency has been the opposite.

2.12.5 Postscript

As already mentioned, trade measures can have unexpected governance impacts. Recent years have seen consumer countries, particularly in Europe, raising import standards of tropical timber. This has been partly due to activist NGOs like Greenpeace and Friends of the Earth, which have raised the stakes by exposing high profile users of illegal timber (e.g., UK government and the John Lewis Company). The European Forest Law Enforcement, Governance and Trade (FLEGT) initiative and the timber procurement policies of several European countries are well-intentioned attempts to reduce the demand for illegal timber. While no one would argue against raising timber import standards, the net effect of these measures on tropical SFM is unclear. A consequence of higher import standards is higher compliance and verification costs for forest managers. Unless these costs are compensated by higher 'forest-gate' prices, they may encourage producers to switch to lower value but less discriminating import markets like China's. According to a recent market report:

> *"West African log prices remained firm buoyed by demand from Asia. In contrast, prices fell for the European market underscoring the diminishing importance of this market for African exporters. Chinese demand for African sawnwood has given domestic processing policies a significant boost"* (ITTO Tropical Timbers Market Report, 11-15 September 2006).

2.13 Forest certification and governance (Publication 13)

Richards, M. (2004). Certification in Complex Socio-Political Settings. Looking Forward to the Next Decade. Forest Trends: Washington, DC. http://www.forest-trends.org/documents/publications/ComplexSettings.pdf

2.13.1 Context

Following the illegal logging study and the review of trade policies and forest governance, I was commissioned by Forest Trends (a forest policy 'think tank' research group based in Washington) to undertake a review of forest certification in 'complex socio-political settings'. This study brought together the forest governance and trade issues explored in publications 11 and 12 with an important demand-side incentive for SFM – forest management certification. Before it appeared on the Forest Trends website, the paper was peer reviewed and presented at two international conferences:

- 'International Congress on Globalisation, Localisation and Tropical Forest Management in the 21st Century' 22-23 October 2003 in Amsterdam. http://www.forest-trends.org/documents/meetings/Amsterdam_2003/CertificationAmsterdam.ppt
- 'Forest Certification in Developing and Transitioning Societies: Social, Ecological and Economic Effects', 10-11 June 2004 at the Yale School of Forestry and Environmental Studies. http://www.yale.edu/forestcertification/symposium/

2.13.2 Methods

This paper is based on an extensive published and grey literature review, supplemented by seven commissioned 'mini' case studies by experienced observers of the progress and challenges of certification in Brazil, Indonesia, Malaysia, Bolivia, Central Africa and Russia.

2.13.3 Original contribution

The paper explores the links between certification and governance issues, given that 'complex socio-political settings' tend to equate with weak governance situations. Although not original, it was perhaps controversial in questioning donor and NGO policies to fast track certification as a demand-side incentive for SFM. It warns that when certification is donor-led and implemented in isolated forest management units (FMUs), this is unlikely to promote SFM in a country. As some of the case studies reveal, when the legal and regulatory framework is ineffective (for example, due to over-complex regulations which encourage forest crime) and inequitable, FMU certification can have negative equity impacts, and may slow down the overall process of moving towards SFM and conservation. This is because it can give credibility to governments that are not tackling the policy and institutional failures driving forest degradation. For example, where indigenous property rights are weakly recognised, certification appears to sanction the rights of industrial forestry concessions over customary tenure areas, as has happened in Indonesia and Malaysia. I am more supportive of certification when it is a national rather than FMU level process, and involves the establishment of national and participatory policy fora, and the setting of national FSC standards.

I also adopt what might be viewed as an anti-market position in advocating a new approach to certification of CFEs, alerting donors and NGOs to the risks and vulnerability of export-oriented forest management systems (Publication 6). Only rarely has international market access been consistently achieved by CFEs, and in general the costs of certification have outweighed the benefits and led to disillusionment. I argue that if CFEs can demonstrate a long-term social and livelihood interest in the forest, they should not be treated identically to industrial forestry enterprises. The paper therefore proposes a 'non-market based certification' process in which communities can obtain non-market benefits of certification, like tenure and institutional security, as well as PES in the longer term. (Scherr et al. (2004a) also advocate local certification standards based on indigenous management values and practices).

2.13.4 Learning

Forest management certification has made rapid progress in temperate countries but slow progress in the tropics. There are various reasons for this, the most important of which is the economic disincentive caused by the 'standards gap'. This is the gap between current forest management standards, as determined by existing laws, policies and their implementation, and the 'gold standard' of the FSC. This gap makes the cost of meeting the FSC standard prohibitive. The cost includes the opportunity cost of shifting to SFM (in this context the opportunity cost is the difference between a high but unsustainable yield and a lower SFM yield). In a stronger regulatory framework, the 'standards gap' diminishes, as has happened in Bolivia, and certification becomes to some extent market-led (Box 1). By contrast, where forest governance is weak and the standards gap is large, certification has been donor-led.

Certification therefore needs to be integrated into a broader forest governance agenda involving the following sequence: firstly, establishment of an equitable and effective legal and regulatory framework (including extra-sectoral legislation); secondly, compliance with forest regulations; and thirdly, certification. Once again, a balanced supply and demand-side approach is needed. The most positive effects of certification, most apparent in Brazil and Bolivia, have been through the development of participatory forest policy fora needed for setting national FSC standards. The paper also compares certification progress in Latin America with Asia and Africa. In terms of the area of tropical forest certified under the Forest Stewardship Council (FSC) in 2006, twelve of the top 20 countries were in South America. The paper suggests that a stronger civil society sector in South America has had a significant influence in bringing about a more enabling policy and institutional environment for certification.

Box 1. Regulatory incentives for certification and SFM in Bolivia

In the early 1990s I observed on several visits that Bolivia's forestry sector suffered from a typical set of problems, including illegal logging, patronage in forest concession allocation, and weak tenure and marketing rights for indigenous communities. But such has been the change that Bolivia has become world leader in terms of the tropical forest area certified by the FSC (over 2 million hectares at October 2006). This is the result of a set of policy, legal and institutional reforms which have encouraged SFM, including a new and depoliticised state forest authority, secure tenure and full timber marketing rights for indigenous communities, area-based forest fees which discourage waste, and a competitive concession allocation system. Therefore switching to SFM and achieving the FSC standards has a relatively low opportunity cost.

It is noticeable however that only one of 16 certified forests in Bolivia is currently under (indigenous) community management. Even with better governance and control there are still major constraints to SFM and certification for communities, including administrative capacity, market risk and diseconomies of scale. Complying with certification regulations typically costs a community US $20,000 in the first year and $8,000 per annum thereafter. This can be difficult without donor or government support. Small-scale illegal logging, e.g., individual chainsaw operators, to supply the domestic market is also still prevalent.

Additional sources to Publication 13: Colchester et al., 2006, http://www.fsc.org/en/whats_new/news/news/54

Finally, the paper comments on the underplayed link between certification and PES. The original assumption of certification was that consumers would pay a 'green premium' in recognition of the ecological benefits of SFM. So far they have been unwilling to do this, so that donors and governments have had to subsidise certification. While subsidies for SFM are justifiable (Publication 8), they can be problematic, e.g., the difficulty of removing them. Since certification effectively shows that a forest is supplying a bundle of ecological services, the logical aim of certification should be to support market-based PES, both at a forest and landscape level.

2.13.5 Postscript

Subsequent to this paper, the author conducted an unpublished study for Timbmet Limited, UK's largest importer of tropical timber, on the costs and benefits of certification for tropical forest managers (Richards, 2004). Based on secondary data, it found that, at least for Southeast Asia, a 10-25 per cent increase in 'forest gate' prices is needed to compensate the net additional costs of certification. This indicates the premium needed for certification to become demand rather than donor led. As noted in 2.12.5, there has been a sharp rise in demand for certified timber in recent years. This has resulted in a small 'risk premium' for certified timber, but it is still insufficient for demand-led certification, and donors continue to be prime movers in promoting certification, even for industrial forestry concessions. For example, it was recently announced that FSC has certified 570,000 hectares managed by the WWF supported Barana Company in Guyana, the largest tropical forest area to be certified by FSC (CFA Newsletter, 2006).

The extension of certification to PES now appears to be on the agenda. The author was recently invited by Forest Trends to take part in a major research study in 2007 to assess how to extend forest management certification to bundled PES.

3. Reflective overview

3.1 Critique of market commodity-based approaches to SFM

The most prominent theme of my publications is that market commodity based approaches in the tropics tend to make both the resource and the forest-dependent poor vulnerable. This vulnerability can occur whether the forest resource has either a higher or lower market value. The main reasons for this are:

- Forest management in the tropics takes place in a weak policy and regulatory environment in which it is more profitable to over-harvest and/or clear forests for other land uses. Unregulated or illegal logging depresses prices[11] and results in an unlevel playing field for law-abiding forest managers who have higher costs than illegal loggers, and alternative land uses seem more attractive. In other words the opportunity costs become too high for SFM. When forest product values are higher due to market proximity or trade liberalisation, the resource becomes vulnerable to rent seeking by external stakeholders; and when they are low there is an incentive to stay competitive by reducing costs through non-compliance (Publications 3, 4, 8, 11, 12).
- As pointed out by Stiglitz (1998), markets need regulating and governance quality is key to the social and environmental outcomes of market based development policies. But political economy realities generally discourage improvements in forest governance; political, business and sometimes military elites have vested interests in weak governance and inequitable law enforcement since this allows them to excercise their rent-seeking powers. The evidence also suggests that governance quality is correlated with economic development, political stability and democratic progress. Poorer countries like Indonesia with abundant natural resources often suffer from 'resource curse' governance problems, while middle income countries (e.g., Brazil and Mexico) tend to have a stronger civil society which demands greater accountability, transparency and social justice;

[11] One source (Seneca Creek, 2004) estimates that illegal production depresses world prices of forest products by 6 to 17 per cent depending on the type of product.

these countries are therefore making better forest governance progress, at least in their export sectors (3, 12, 13).

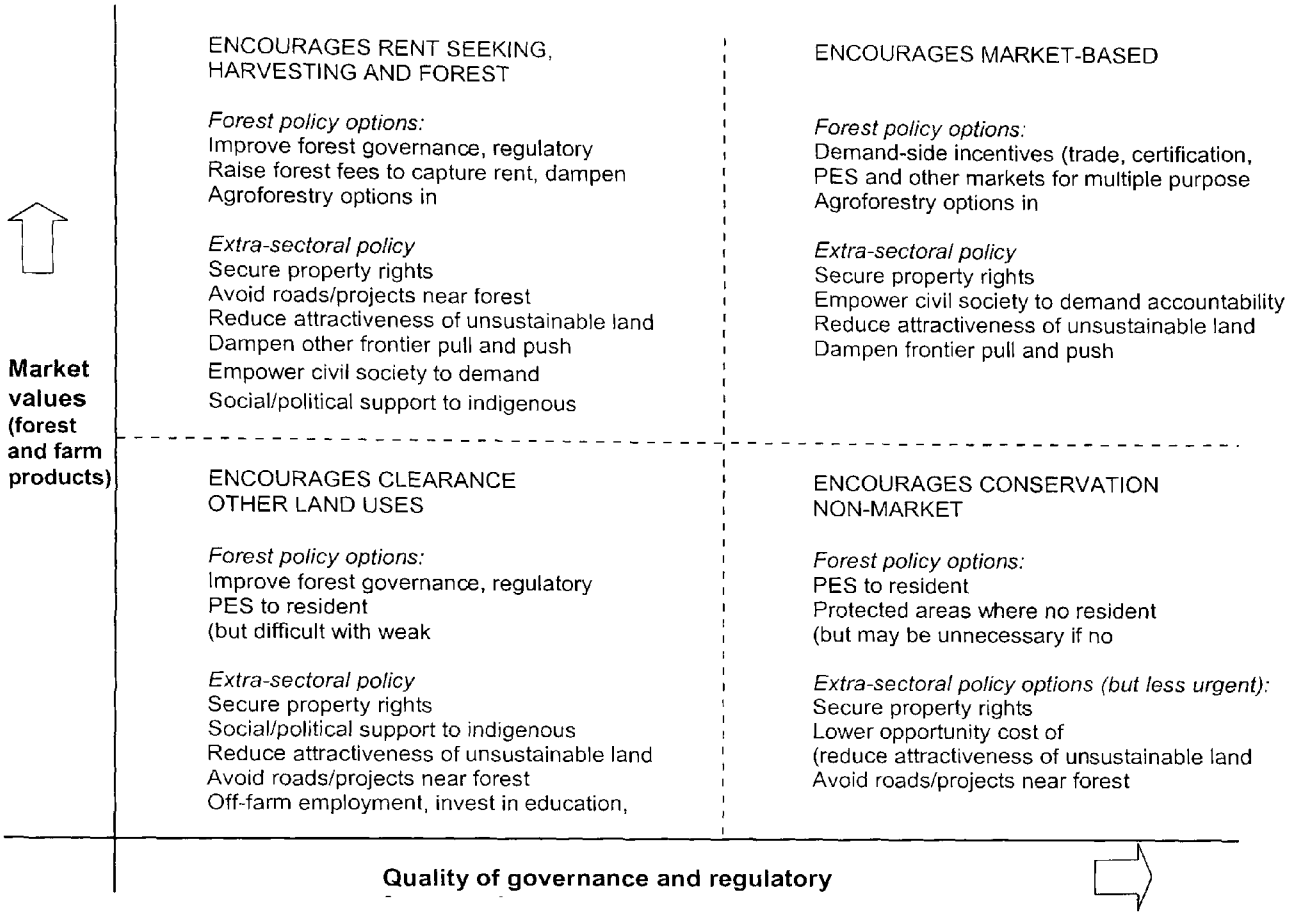
- The viability of SFM depends on a market place that values multiple purpose forestry, including ecological services, a wider range of NTFPs and lesser known timber species. The obvious advantages of PES are that there is no risk of over-exploitation, they are voluntary and do not involve so much external funding since they 'internalise the externalities'. But without effective global governance of public goods like forest carbon and biodiversity, there is little willingness to pay for them, except in emerging voluntary carbon and biodiversity offset markets (8, 13).
- Forest product market-based approaches may be less appropriate for indigenous societies since they can cause a clash of incentives. At least among Amerindian groups, this weakens indigenous institutions which prevent free-riding in common property regimes (6, 9).
- A primarily forest sector approach will have limited success while the main drivers of forest decline are 'extra-sectoral', e.g., insecure tenure, roads or development projects near forest areas, subsidised agriculture, inappropriate tenure legislation, etc. (4, 7, 8, 11).

3.2 Market values, forest governance and appropriate policies

"Effective action to protect existing forests ... requires changes to the structure of economic incentives that lead to unsustainable logging and to the conversion of forestland to agriculture" (Stern, 2006: 540)

Building on 3.1, Figure 1 is a simplistic attempt to show some of the policy implications of the interaction between market values and forest governance (or the regulatory framework). The y axis includes both forest and farm product values, since they tend to be correlated according to market access and distance, although a high value timber species or NTFP can occasionally cause remote but accessible forests to have a high 'stumpage value'.

Figure 1. Interaction of market values and forest governance in determining incentives and policy options



Where market values are high and governance or control is weak (upper left quadrant), forests are vulnerable to rent seeking, illegal logging and over-exploitation. The forest sector priorities are obviously to strengthen control and governance, as well as appropriate forest pricing to dampen timber demand from state forests. Strengthening the property rights of resident stakeholders, especially indigenous groups, is critical, as are efforts to dampen extra-sectoral pressures on forests and support civil society so that it demands greater accountability and transparency from a powerful forest industry. In this situation, trade-based or demand-side incentives for SFM tend to cause unintended or perverse incentives, especially for local stakeholders. There is more potential from targeting niche agroforestry market opportunities for products like certified cocoa or coffee, especially in forest-farm

'mosaiclands' (Chomitz et al., 2006). There may also be win-win opportunities in forest transition areas, where rising timber prices are stimulating secondary forest regrowth on abandoned agricultural land (Rudel et al., 2005).

When both governance and forest values are low (lower left quadrant), the main threat is conversion to other land uses. The main priorities are again to raise forest governance levels, secure property rights, and dampen or counteract extra-sectoral policies which are less critical to the broader development process. A new road for example, while it will increase the stumpage value of forests, will provide a bigger stimulus to agriculture, facilitate the arrival of colonists and ranchers, subsidise unregulated logging and cause land speculation. Off-farm employment, higher off-farm wages and rural education may also help reduce the agricultural pressures (Southgate, 1998). At the same time care is needed that such measures do not also increase demand-pull to the frontier (7).

Since governments are increasingly willing to devolve lower value forests to communities (Molnar et al., 2004), and indigenous groups tend to inhabit more remote forests, there are important policy implications for PFM in this quadrant. Ratification and defence of property rights, PES and/or social and political support to indigenous societies in support of traditional natural resource management regimes can achieve win-win outcomes, although intra-community equity can be problematic (6, 10). Protected areas have a role but may be less cost-effective for conservation (only) outcomes.

Where market values are higher and forest governance is improving (upper right quadrant), the emphasis can shift towards demand-side incentives for SFM. But market proximity or access also encourages other land uses. It therefore remains important to dampen or counter extra-sectoral policies that increase the opportunity costs of SFM. (But it can be very difficult to modify these due to the perceived or real development benefits, not to mention political economy constraints). Conservation is an expensive option when alternative land uses are profitable, but PES would have high potential in a better governance framework. There is however an important caveat about

'displacement' of deforestation to weakly regulated countries through international trade when a country reduces its timber production by better control and governance. As already mentioned, niche market opportunities for agroforestry systems and sustainable livelihood opportunities in forest transition areas should also be promoted.

Where market values are low due to accessibility and distance factors, and governance and control are improving (lower right quadrant), conservation rather than market-based SFM has a better chance of success. PES or the 'contract exchange' approach - commitments to environmental stewardship in exchange for social and political support - with indigenous groups have a high potential. However this situation is rare since governance tends to be minimal in remote areas, and an 'uncivil society' often fills the governance vacuum (4, 11).

3.3 Carrots and sticks: a question of balance

3.3.1 The 'supply side': governance and law enforcement

Many of my publications show that getting the 'supply side' right is essential for SFM, and is a precondition for the effectiveness of demand-side incentives like PES, trade liberalisation and certification. But in retrospect I realise there is an apparent dichotomy or contradiction in my publications. On the one hand most of them argue that a stronger regulatory and governance framework is the main way forward, but on the other hand many highlight the political economy constraints to effective policy and institutional reform (3, 4, 11, 12). I also observe that excessive regulations impose heavy burdens on forest managers, encourage evasion and corruption, and are expensive to enforce (11, 12). History therefore shows that 'control and command' strategies tend to be ineffective and inefficient.

My observations, further reading (e.g., Chomitz et al., 2006; Colchester et al., 2006) and involvement in an FAO/ITTO 'expert workshop' to promote best

practice in legal compliance[12], lead me to a more nuanced view of the 'supply side' agenda. This includes an increasing realisation that 'carrots' can play a key role in encouraging or facilitating the 'sticks', as well as visa versa. I therefore suggest the following areas are key to improving the 'supply side':

i. simplification and rationalisation of laws and regulations;
ii. use of market-based incentives for legal compliance when there is an adequate governance platform for them to work;
iii. building national consensus for legal and policy reforms, including through public education campaigns based on the costs of forest crime;
iv. increased transparency of the forest industry and state forestry authority;
v. support for NGOs and civil society in their efforts to increase downward accountability and promote equity in legal and judicial systems.

The need to simplify and rationalise over-complex and sometimes contradictory legal and regulatory systems (i) was a key conclusion of the Central America illegal logging study (11) and is emphasised in the FAO/ITTO good practice guidelines (FAO/ITTO, 2005). As regards (ii), the best incentive for compliance would be PES, but there is also scope for positive regulatory incentives. For example, Bolivia's forest legislation exempts certified forestry enterprises from state audits, saving both parties significant transaction costs (13). Certification, which obliges legal compliance, also provides access to higher value wood product markets like Europe, although communities have struggled to participate in these.

Recent examples show the potential of market-based approaches for legal compliance (Chomitz et al., 2006):

- Brazil's 'Transferable Forest Protection Obligations' cap and trade system which provides landowners with a strong incentive to maintain more than the legal minimum of their landholding as forest (see 2.7.5);
- Concession auctions, area-based fees (which reduce waste) and 'performance bonds' in Cameroon. Increased competitiveness for concessions helps compliance, as does the performance bond in which a

[12] To which I contributed a case study on forest governance and law enforcement in

lump-sum deposit by a concessionaire is returned to him/her gradually over several cutting cycles on the basis of independent monitoring (8).

But these market-based approaches still require forest governance and administrative capacity for their effective implementation, as well as independent verification of compliance. A recent review of PES (Scherr et al., 2006) also points out that a stronger and more equitable legal and institutional framework is essential for pro-poor PES, again showing that a 'supply' and 'demand' balance is indispensable.

The Central American illegal logging study (11) adopted the approach suggested in (iii), and to some extent (iv) and (v). Using estimates of the economic, social and environmental costs of illegal logging, we worked to build a consensus for reform through national multiple stakeholder workshops, popular posters and media coverage. In a follow-up programme, Global Witness is working closely with civil society groups to increase transparency and raise public awareness, and aims to introduce 'Independent Forest Monitoring' as in Cameroon and Cambodia (Global Witness, 2005). More equitable legislation and judiciary systems (v) are also key to the equity impacts of PES markets. This requires innovative measures to increase administrative and judicial transparency and accountability, multi-stakeholder platforms for conflict management, etc.

My later publications provide a warning about unilateral approaches to forest governance, and show the importance of regional approaches as in the FLEG initiatives. This is due to the problem of displacement already discussed. Thus China's imports from the rest of Asia, as well as Africa, have increased enormously following its logging ban. This raises a possible concern about the SFM impacts of higher European import standards: higher compliance and verification costs in Africa without a commensurate increase in producer prices may be causing suppliers to switch to the less demanding China market. Ironically, much of the timber ends up in Europe as re-exports

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Indonesia to this study (FAO/ITTTO, 2005).

(2.12.5). The challenge is how to simultaneously raise import standards in China as well as in other large markets like North America and Japan.

3.3.2 The 'demand' side: PES and other incentives

Another common finding of my publications is that without PES, SFM and conservation are unlikely to be viable. Global and national governance and regulations are essential for generating willingness to pay for public goods (8). Thus Molnar et al. (2004) call for a global forest convention and other mechanisms to recognise and support community conservation, while Southgate (1998) argues that the UN Convention of Biological Diversity should levy charges on transnational activities using the 'global commons'.

Carbon is the one forest-related public good for which global governance has created a market for ecological services, but natural tropical forests are excluded from the CDM, as well as from the European (emissions) Trading Scheme. But with the support of high profile advocates like Stern (2006) and Stiglitz (2006), there is increasing momentum to include 'avoided deforestation' (AD) in the second accounting period (from 2013) of the Kyoto Protocol, and possibly before. According to the Stern Report, AD offers a relatively cheap and quick way of cutting up to a fifth of global carbon emissions. Since AD is a logical culmination of my repeated emphasis on PES, as well as the supply-side 'pre-conditions', and in view of the unique political opportunity for forests provided by the climate change agenda, I feel justified in devoting some space to it.

A common aspect of the various AD proposals (see 2.8.5) is that reduced deforestation is only possible through national programmes due to the 'leakage' or displacement problem, and in order to reduce national deforestation rates, the policy and institutional failures would have to be tackled. But there are various challenges requiring considerable international political will and resources for AD to be operationalised on a sufficient scale to have a major impact. The first challenge is whether to include it in the CDM of the Kyoto Protocol. This is mainly due to concerns about market flooding and the carbon price, environmental integrity and reduced pressures to cut

industrial emissions, risks and impermanence. But, as argued by Chomitz et al. (2006) and others, AD would enable more ambitious emission caps, lower global mitigation costs, 'buy time' for technology and policies to effect cuts in industrial emissions, and increase developing country participation in Kyoto, thereby facilitating US participation. A way may also need to be found to compensate the 'losers' among tropical forest countries. The winners will be those with high deforestation rates and the losers those with low deforestation rates: a key issue is whether and how much to reward past conservation efforts. For Ebeling (2006) this may require introducing some 'hot air' into the system, as happened when Russia was persuaded to ratify Kyoto.

Assuming the political hurdles can be overcome, AD would also require considerable up-front funding since carbon payments will mainly occur ex-post[13]. Significant investments will be needed both for developing the required national carbon infrastructure, including specialised institutions and technology, and the policy and regulatory reform process. Judging by the experiences of Bolivia and Cameroon, two relative success stories, the latter will require strong donor support. Therefore the international community will need to take the lead in pre-financing AD and/or underwriting risks to forward investors in AD credits. But even with the climate change agenda, and the obvious premium on good governance in AD (Ebeling, 2006), it is uncertain whether industrialised countries will make the commitments required. In this case, probably only mid-income Latin American countries, China, India, South Africa and some Asian 'tiger' economies would be able to rapidly develop a national AD programme.

Another challenge will be how to translate national level carbon payments into local level incentives that compensate land use opportunity costs. There are also various equity concerns, including that vested interests might expropriate property rights that are not fully formalised (e.g., under customary land tenure)

[13] 'Ex-ante financing' by buyers of AD credits is a possibility, but would involve heavily discounted prices (due to the risks) or very expensive insurance. A possible semi-commercial approach might be low interest loans to be repaid from carbon payments. However this runs a risk if governments think there is a chance of debt forgiveness.

or in some way attenuate the rights of resident stakeholders to exclude carbon. As proposed by Swallow et al. (2005), there is an urgent need for collective action and second-tier PES institutions for indigenous and other local communities, not least to lower transaction costs.

PES markets can also be voluntary, as in the case of voluntary carbon and biodiversity offset markets responding to increased pressures for corporate social responsibility and individual concerns to neutralise carbon footprints. Voluntary markets have the advantage of flexibility, so that valuable experience is being gained in how to combine carbon and biodiversity ('biocarbon') and/or social benefits in the Chicago Climate Exchange and other markets (Bayon et al., 2006).

Apart from carbon forestry, the most promising and fastest growing PES markets are payments for watershed protection, biodiversity offsets and 'eco-certified' products (Scherr et al., 2006, Bishop et al., 2006). Demand for clean water could double or triple by 2050, while watershed erosion and agro-chemical use are increasing its scarcity. Watershed PES can be for water quality (including reduced nutrient loading), flood control and dry season water flow, although the role of forests in these services is site-specific and often lacks a strong scientific basis. Public or state-mediated schemes are currently much more important than private or market-based schemes. Watershed PES schemes have grown rapidly in Latin America, but are less common in Africa and Asia, except in China where there is a major programme (Scherr et al, 2006).

Markets for biodiversity offsets are also growing fast, although they are currently on a much smaller scale. There is most scaling-up promise from regulatory-based biodiversity offsets like Brazil's system based on land use legislation (Section 2.7.5). There are also increasing examples of voluntary biodiversity offsets, in which mining, power and other development projects commit to offset their biodiversity and livelihood impacts in order to obtain 'license to operate' (Bishop et al, 2006). On the other hand 'bioprospecting', in which pharmaceutical companies make 'stewardship' payments to local

stakeholders in exchange for commercial germplasm development rights, has been relatively disappointing (Bishop et al, 2006).

As regards the more established markets for forest products and services, eco-tourism is often singled out as being of the greatest promise, partly since it rewards conservation rather than exploitation. But eco-tourism has had moderate success, with most benefits going to urban-based tourism companies (GEF, 2006), although there are some notable exceptions. These include the model participatory approaches of the Communal Areas Management Programme for Indigenous Resources (CAMPFIRE) approach in Zimbabwe, now replicated in a modified form in Zambia and Namibia, and the Rainforest Expeditions Project in the Peruvian Amazon supported by Conservation International and EcoLogic (Bishop et al, 2006). But these experiences tend to require high and niche market values, like those associated with big game sport or 'trophy' hunting, and/or long-term donor or international NGO support.

As discussed in Section 2.13, there is growing demand for certified forest products, but as yet this has not resulted in significant premiums and thus incentives for SFM – the spread of certification in developing countries has therefore been slow, and donor rather than demand-led. A problem for certification is that it raises the compliance costs for forest managers, so that it is unlikely to 'lift off' as a demand-side incentive until there are strong regulatory incentives for it as, for example, in Bolivia (Box 1). On the other hand, markets for certified agroforestry products like shade-grown or 'bird-friendly' coffee and cocoa have resulted in significantly higher returns for farmers, and therefore hold great promise for degraded forest areas or farm-forest 'mosaiclands' (Chomitz et al, 2006).

Non-timber forest product markets have clearly stimulated SFM in some areas (e.g., rattan in Southeast Asia), but international markets can be volatile as discussed in Section 2.2. Vertical intregration and innovative supply-side institutional arrangements, like extractive reserves, are essential for increasing value-added to managers; otherwise returns to labour tend to be

very low and may lock forest peoples into poverty. Arguably the most urgent policy measure associated with forest product markets is removal of state-imposed market restrictions and correction of other marketing policy failures (Arnold, 2001). In general 'commodity' markets for timber and NTFPs have not *per se* resulted in SFM, and more diversified multiple-objective forest management strategies are more likely to achieve SFM objectives. There is also a high potential to combine PES with the sustainable management of NTFPs or timber, as is being explored in a few locations, for example in Acre State, Brazil (Section 2.7.5).

3.4 Participatory forest management – win-win outcomes?

An important aspect of my research journey has been to consider the 'win-win' (environmental and equity) potential of tropical forests. Various donors and international NGOs have keenly promoted market-based PFM as a win-win strategy. Also governments increasingly see devolution of state forests to communities as a low cost strategy for SFM - about 25 per cent of the forest area of developing countries is now under community ownership or management, and this could double by 2050 (Molnar et al., 2004). There is however an asymmetry in the distribution of costs and benefits of PFM which may explain why win-win outcomes are rare, and that where they have occurred they have needed prolonged donor support (1, 6, 8, 9). Most public good benefits of PFM accrue to national and international beneficiaries; and with marketed forest products, most of the market value is captured by downstream processors and traders. For local forest users, opportunity costs are often high, including from limitations on their farming practices and forest product extraction. A cynical view might be that getting communities to look after forests is a cheap way of obtaining global public goods.

Recent literature (see 2.6.5) backs up my finding that communities, and especially indigenous communities, are normally more effective resource managers than the state or private sector, largely due to differences in underlying incentives. It is observed that PFM with appropriate legal and governance support tends to be self-regulating. It is therefore questionable whether CFEs should be subject to the same rigour as regards legal

compliance as industrial forestry, as is the case in forest management certification (13).

Several of my papers reveal trade-offs between environmental and social outcomes; this reflects the multiple benefits and stakeholders in tropical forests and the problems of intra-community equity in PFM. My studies of community forestry in South Asia reveal that the benefits are skewed towards households with more cattle and agricultural land, and the poorest households have become worse off than under open-access commons situations in which they had free access to NTFPs, including firewood and grazing (9, 10). Environment-equity trade-offs are also discussed at length by Chomitz et al. (2006: 60-70), implying they are more the rule than the exception.

The limited success of Integrated Conservation and Development Projects (ICDPs) is also instructive. ICDPs have been generally unable to reconcile conservation and development objectives, falling short particularly in their environmental objectives (Chomitz et al., 2006), as with Honduras' experience (4). According to Chomitz et al. (2006), ICDPs are only likely to succeed if quid pro quo payments are made to communities based on measured conservation outcomes.

The latter observation coincides with my findings (6, 13). Until effective pro-poor PES mechanisms are in place, there are equity and even ethical concerns about donor encouragement of communities down the high risk route of market-based SFM, especially for timber. This is particularly risky for Amerindian communities with limited market exposure. Increased risk and therefore higher discount rates reduces the viability of SFM. For indigenous conservation efforts, a PES or 'contract exchange' approach is more likely to secure win-win outcomes, and interferes less with traditional CPR management systems. Appropriate compensation for indigenous communities is a major concern since tropical forests are particularly concentrated in areas occupied by indigenous peoples according to Molnar et al. (2004), who also suggest that secure property rights or contracts offering social services rather than payments may be more effective.

A problem with PES markets is that they do not inherently favour the poor since the primary concern of buyers is environmental cost-effectiveness, as well as due to biases in legislation and governance. As pointed out by Molnar et al. (2004), additional legislation is usually needed to ensure their property rights over ecological services, and institutional support is required to channel PES to communities. Another review (Scherr et al., 2004b) concludes that PES markets are unlikely to contribute substantially to poverty alleviation without subsidies. For example, pro-poor carbon forestry depends on donors or governments subsidising the very high transaction costs and diseconomies of scale associated with community based carbon trading.

But in the current environment, and with limited alternative livelihood options, forest dependent communities have no alternative to pursuing whatever market opportunities come their way. When it comes to engagement with markets, the first priority is full and effective property rights since "where resource rights are informal, contested or weakly enforced, potential benefits can be more than offset by the risks of loss of rights to land, to harvest products, to environmental services, to access to resources and the employment associated with this access, and loss of control and flexibility over local development options" (Scherr et al., 2006:37). These include the rights to process and market products without undue regulations and charges, which have severely limited market access for small-scale producers. In some PFM models, as in JFM in India, local users have few or no property rights, and, as observed in Himachal Pradesh, can end up as little more than paid labourers on Forest Department plantation projects. Where there is greater participation in JFM, marketing rights tend to be severely constrained.

At the same time it is important to note that secure tenure and access to forest markets do not guarantee SFM; for example, secure tenure can also encourage conversion for perennial crops (Chomitz et al., 2006). Market-based PFM also needs equitable legislation, administrative and judiciary mechanisms that prevent encroachment by outsiders, political support so that communities can negotiate on an equal footing with other stakeholders, and

capacity building to help them develop efficient businesses (Donovan et al, 2006). There is also a need for partnerships or alliances through the market supply chain; international NGOs have brokered several successful partnerships between CFEs and downstream processors or importers, sometimes involving 'fair trade' deals (Scherr et al., 2004a).

Several of my papers indicate that win-win outcomes are more likely to emerge from a holistic or livelihoods-based approach, rather than a commodity focus. For example, the livelihood mosaic of the Mexican 'forest *ejidos*' (1) has proved enduring in spite of weak forest product markets; Bray et al. (2004) report the development of 'sustainable landscapes' partly based on institutional innovation and an emerging forest transition process. Embracing complex livelihood issues is also integral for 'integrated natural resource management in tropical forest landscapes' (Frost et al., 2006). In the PFM systems of South Asia, an important 'win-win' option is to foster agricultural-forestry linkages, for example, upgrading dairy breeds and giving the poor access to cattle (10). Arnold (2001) also observes the scope for PFM to move from a forest protection orientation to the promotion of sustainable livelihoods in agroforestry-based systems. These can take advantage of niche but expanding PES markets, e.g., for shade-based 'bird friendly' or organic cocoa and coffee.

Finally, an inherent weakness of the 'win-win' case is that forestry has relatively modest poverty reduction impacts and may lock people into poverty (Wunder, 2001). While forest product activities can help the poor survive, they have less potential than other sectors like agriculture and education to contribute to 'livelihood enhancement' (Arnold, 2001).

3.5 Research recommendations

It would be a major task to identify the research gaps for SFM and conservation given the enormous range of research undertaken by institutions like the World Bank, CIFOR, Forest Trends, ITTO, FAO, IIED, ODI, World Resources Institute and several international NGOs, and in the case of carbon forestry by the technical bodies of the UN Climate Change Convention. Rather

than attempt to identify under-researched areas, I present some recommendations which I think have particular 'win-win' potential. I have classified these into five main areas, accepting that there are obvious overlaps between them: avoided deforestation (AD) carbon forestry; forest governance; community conservation; SFM and other 'sustainable landscape' livelihood options; and extra-sectoral policies.

I have placed considerable emphasis in this narrative on the potential for AD. For this to be operationalised, key research priorities include:

- Further analysis of strategies to overcome the obstacles and challenges to inclusion in the Kyoto Protocol;
- Investigation of advance funding options, e.g., ex-ante carbon payments underwritten by donors and governments, low interest loans, etc.
- Investigation of the country level costs of implementing AD leading to identification of cost-effective countries for AD (i.e., those combining high rates of deforestation with high potential for improved governance) and appropriate support for the development of country programmes;
- Action research to identify appropriate micro-level incentive mechanisms to complement national level actions;
- Research into new/appropriate PES institutions to support indigenous and other local communities in their response to AD and other PES opportunities, e.g., collective action and second tier enterprises that are supportive of local institutions and reduce transaction costs.

For forest governance, research priorities include:

- Revision of national forestry and other sector legislation for the design of simplified and equitable laws and regulations;
- Illegal logging studies similar to the Central America study (11) that document the full range of costs to society, and prepare the ground for follow-up initiatives with constituencies for change;
- Innovative approaches to equitable law enforcement, judicial accountability, and legal compliance, including market-based approaches.

For community-based conservation, priorities include:

- Action research on community concessions, conservation easements or other 'contract exchange' type agreements with indigenous communities;
- Development of certification of bundled ecological services based on indigenous or local management practices and standards;
- In upper watershed areas, win-win PES can be encouraged by research to establish willingness to pay by downstream beneficiaries for clean water from sustainable farming practices, and institutional capacity building for effective negotiation and development outcomes (e.g., there are some reported cases of strengthened tenure from such initiatives).

As regards SFM and other 'sustainable landscape' livelihood options, important research and development areas include:

- Research on appropriate capacity building of CFEs, e.g., business development services, the development of supply chain partnerships, second tier cooperatives, etc.
- Promotion of niche market opportunities for agroforestry systems, and sustainable livelihood options in forest transition zones;
- Research on the SFM impacts of higher European import standards, and further analysis of how to influence China's import standards.

Extra-sectoral research priorities include:

- Strategies and technologies to accelerate the demarcation and formalisation of the full property rights of resident stakeholders;
- More economic policy research on the environmental impacts of extra-sectoral policies, and increased support for inter-sectoral planning processes;
- Research on the win-win impacts of human and social capital development in forest dependent communities, especially appropriate rural education oriented towards sustainable livelihoods.

3.6 Conclusions

"The more effective instruments tend to be controversial, expensive, difficult to implement, and/or contrary to the prevailing free market ideology ... there are few simple, cheap, first-best, non-market distorting solutions out there." (Kaimowitz, 2000:230)

My research journey of the 'difficult economics' of tropical forestry concludes that domestic forest governance, global governance regulations that stimulate PES and capture public good values, secure property rights for resident stakeholders and appropriate extra-sectoral policies are key missing ingredients of SFM. I have found that market incentives for SFM and conservation are weak, and will remain so until the market and policy failures are effectively tackled, and a multi-sectoral approach is adopted (Kaimowitz, 2000). But vested interests in the *status quo* make it very difficult to tackle the policy and governance failures. Therefore the viability of timber-based SFM in species-diverse tropical forests remains doubtful. I have also found that in a weak regulatory framework, the resource and resident stakeholders are vulnerable whether forest values are high or low.

A major concern of this narrative has been the potential for 'win-win' outcomes. In general trade-offs between social and environmental objectives are more common than win-win outcomes. While PES markets remain incipient there are equity/ethical questions about the promotion of market-based PFM; indigenous management systems are particularly vulnerable due to the clash of market incentives with indigenous institutions. PES markets could prove more compatible, but carbon forestry is unlikely to be pro-poor unless donors and/or governments subsidise the very high transaction costs. It is therefore difficult, at least for this observer, to conceive of an equitable solution to what is essentially a public goods problem (ecosystem protection) without governments and the international community playing a strong governance and regulatory role. In the longer term, progress towards SFM

and conservation will depend on economic and political (democratic) development, including increased accountability of policy decision-makers, the forest industry, the state forestry authority and the judiciary to civil society.

I regard 'avoided deforestation' as offering most current hope for tropical forest conservation since it is linked to the climate change agenda and requires national level programmes, and could therefore harness sufficient international political will to tackle the underlying causes of deforestation. In theory it links the supply and demand side of SFM by acting as a market incentive for improved governance. But there are some major challenges to overcome, including the politics of inclusion in Kyoto and the need for up-front funding, especially for the legal, governance and policy reform process.

As regards my research hypothesis, my papers confirm that a better understanding of the micro-economic incentives experienced by forest managers, local users and other stakeholders is essential for effective SFM and conservation projects and policies. But my research leads me to slightly modify my hypothesis that 'undervaluation' is the main problem for tropical forests. In practice higher value forests without effective governance are more at threat than lower value forests due to their attraction to rent seeking stakeholders, while more distant or inaccessible forests with lower market values, but important livelihood and cultural values, are more amenable to the multiple objectives of community managers. This means that 'green capitalism' approaches to 'saving the rainforest' by giving it market value (except for their ecological services) should be treated with great caution.

There is therefore no substitute for a governance based and multi-sectoral approach to reduce the opportunity costs of SFM and conservation, as would need to happen for countries to receive 'avoided deforestation' carbon payments. In the final outcome, tropical forests will survive either because they are too remote or inaccessible to be worth exploiting or clearing, or because their ecosystem services are adequately compensated, as is the case for the heavily subsidised forests of most industrialised countries.

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Wunder, S. 2000. *The Economics of Deforestation. The Example of Ecuador*. St Anthony's Series. Basingstoke, UK: Macmillan Press.

Wunder, S. 2001. Poverty alleviation and tropical forests - what scope for synergies? *World Development* 29 (11): 1817-1833

APPENDIX 1

DETAILS OF PUBLICATIONS

Table A1. List of Publications in chronological order of research (all refereed or peer reviewed)

Period of research	Authors as listed, title of publication, publication reference	ISSN	No. of pages	Year of publication	Candidate's % contribution
Jan-May 1991	1. Richards, E.M. 1993. Lessons for Participatory Natural Forest Management in Latin America: Case Studies from Honduras, Mexico and Peru. *Journal of World Forest Resource Management* 7:1-25. AB Academic Publishers	021-4286/93	25	1993	100%
Feb-May 1992	2. Richards, M. 1993. The Potential of Non-Timber Forest Products for Sustainable Natural Forest Management in Amazonia. *Commonwealth Forestry Review* 72 (1): 21-27. Commonwealth Forestry Association, c/o Oxford Forestry Institute, University of Oxford	0010 3381	8	1993	100%
Sept 1992 – June 1993	3. Richards, M. 1995. Role of Demand Side Incentives in Fine Grained Protection: a case study of Ghana's Tropical High Forest. *Forest Ecology and Management* 78: 225-241. Elsevier Science	0378-1127/95	17	1995	100%
Feb-May 1994	4 (a). Richards, M. 1996. Protected Areas, People and Incentives in the Search for Sustainable Forest Conservation in Honduras. Environmental Conservation 23 (3): 207-217	0376-8929	11	1996	100%
	4 (b). Richards, M. 1997. Alternative Approaches and Problems in Protected Area Management and Forest Conservation in Honduras. pp.142-156 in de Groot, J. P. & Ruben, R. Eds. Sustainable Agriculture in Central America. Basingstoke/ London: Macmillan Press; and New York: St Martin's Press. (Papers from the 1995 Annual Conference of the Association for European Research on Central America and the Caribbean, held Oct. 14-15, 1995 in Paris, France)	0-333-68228-9	15	1997	100%

June–Aug 1994	5. Richards, M. 1994. Towards Valuation of Forest Conservation Benefits in Developing Countries. *Environmental Conservation* 21 (4): 308-319. Distributed by Elsevier Science for The Foundation for Environmental Conservation, Geneva	0367-8929	12	1994	100%
Sept 1994 – June 1995	6 (a). Richards, M. 1997. Common Property Resource Institutions and Forest Management in Latin America. *Development and Change* 28 (1): 95-117. Blackwell Publishers on behalf of the Institute of Social Studies, The Hague	0012-155X	13	1994	100%
Mar-June 1998	6 (b). Richards, M. 2006. Institutional and Economic Issues in the Promotion of Commercial Forest Management in Amerindian Societies. Pp.181-192 In Posey, D.A. and Balick, M.J. Eds. Human Impacts on Amazonia. The Role of Traditional Ecological Knowledge in Conservation and Development. New York: Columbia University Press. (Papers from First Oxford Amazon Conference, "Human Impacts on the Environments of Brazilian Amazonia: Does Traditional Ecological Knowledge Play a Role in the Future of the Region?" June 1998, Oxford University Centre for Brazilian Studies).	0-231-10588-6	12	2006	100%
July-Dec 1995	7. Richards, M. 1997. *Missing a Moving Target? Technological Change on the Amazon Frontier.* ODI Research Study. Overseas Development Institute, London	0-85003-301-2	110	1997	100%
Oct 1998 – Oct 1999	8. Richards, M. 1997. Can Sustainable Tropical Forestry be Made Profitable? The Potential and Limitations of Innovative Incentive Mechanisms. *World Development* 28 (6): 1001-1016. Elsevier Science Ltd.	0305-750X	16	1997	100%

Nov 1997 – Dec 2001	9. Richards, M., Davies, J. and Yaron, G. 2003. *Stakeholder Incentives in Participatory Forest Management. A Manual for Economic Analysis*. ITDG Publishers. London	1-85339-559-5	254	2003	60%
Jan-April 1999 and Mar-July 2000	10. Richards, M., Maharjan, M. and Kanel, K. 2003. Economics, Poverty and Transparency: Measuring Equity in Forest User Groups. Journal of Forest and Livelihood 3 (1): 91-104. Forest Action, Kathmandu (Special Joint Issue with Overseas Development Institute Rural Development Forestry Network, funded by DFID)	1684-0186	15	2003	50%
Oct 2001 – Dec 2002	11. Richards, M., Wells, A., Del Gatto, F., Contreras-Hermosilla, A. and Pommier, D. 2003. Impacts of illegality and barriers to legality: a diagnostic analysis of illegal logging in Honduras and Nicaragua. *International Forestry Review Vol* 5 (3): 282-291. Commonwealth Forestry Association (Special Issue on Illegal Logging funded by World Bank and DFID)	1465 5489	10	2003	35%
June 2002 - May 2003	12. Richards, M. 2004. Forest trade policies – how do they affect forest governance? *Unasylva 219*: 39-43 Food and Agriculture Organization of the United Nations. Rome	0041-6436	5	2004	100%
May – Oct 2003	13. Richards, M. with contributions from Colchester, M., de Freitas, A., Karpachevskiy, M., Moreno Sanjines, H., Ozinga, S., Packer, M. and Ptichnikov, A. 2004. Certification in Complex Socio-Political Settings. Looking Forward to the Next Decade. Forest Trends http://www.forest-trends.org/documents/publications/Complex%20Settings.pdf.	1-932928-10-3	41	2004	100%

List of sub-publications and conference presentations

1. Journal of World Forest Resource Management, 1993

    1.1 Richards, E.M. 1991. The Forest Ejidos of South-East Mexico: A Case Study of Community Based Sustained Yield Management. *Commonwealth Forestry Review* Vol 70 (4) No. 224: 290-311 ISBN 0010 3381.

    1.2 Richards M. 1993. The Pitsawying Groups of Nothern Honduras: Progress and Problems. ODI Rural Development Forestry Network Paper 16e: 18-27. Winter 1993. London: Overseas Development Institute. ISSN 0968 2627

2. Commonwealth Forestry Review, 1993

    2.1 Richards, E.M. 1993. Commercialization of Non-Timber Forest Products in Amazonia. NRI Socio-economics Series 2. Chatham: Natural Resources Institute. ISBN 0 85954 3382

3. Forest Ecology and Management, 1994

    3.1 Sargent M., Husain T., Kotey N., Mayers, J. Prah, E., Richards, M. and True, T. 1994. Incentives for the sustainable management of the Tropical High Forest in Ghana. *Commonwealth Forestry Review* Volume 73 (3): 155-163

4 (a). Environmental Conservation, 1996
(b). Macmillan Press, 1997

    4.1 Richards M., Navarro G., Vargas A. & Davies J. 1996 Decentralising Forest Management and Conservation in Central America. *Overseas Development Institute Working Paper* 93. London.

5. Environmental Conservation, 1994

    5.1 Richards M. 1997. The Potential for Economic Valuation of Watershed Protection in Mountainous Areas: A Case Study from Bolivia. *Mountain Research and Development* Volume 17 (1): 19-30

    5.2 Richards M. and Davies P. 1999. Economic Concepts for the Forest Sector. Chapter 3. Economics for Environmental Management. pp.81-144. In Volume 3. Green Issues. Water Supply and Sanitation, Agriculture, Forestry and Wildlife Resource. London: Crown Agents under contract with the Department For International Development, UK. ISBN 0 85592 053 X

6 (a). Development and Change, 1997
(b). Colombia University Press, 2006

6.1 Richards, M. 1997. Tragedy of the Commons for Community-Based Forest Management in Latin America. Natural Resource Perspectives 22. London: Overseas Development Institute. ISSN: 1356-9228

6.2 Paper presented at First Oxford Amazon Conference, "Human Impacts on the Environments of Brazilian Amazonia: Does Traditional Ecological Knowledge Play a Role in the Future of the Region?" June 1998, Oxford University Centre for Brazilian Studies

7. Overseas Development Institute, 1997

7.1 Richards, M. 1996. Stabilising the Amazon Frontier: Technology, Institutions and Policies. Natural Resource Perspectives 10. London: Overseas Development Institute ISSN 1356-9228

8. World Development, 2000

8.1 Richards M. 1999. Internalising the Externalities of Tropical Forestry: A Review of Innovative Financing and Incentive Mechanisms. EU Tropical Forestry Paper 1. London: Overseas Development Institute/European Commission. ISBN 0 85003 4027.
Also published in Spanish (ISBN 0 85003 470 1) and Portuguese.

8.2 Richards, M. & Moura Costa, P. 1999. Can Tropical Forestry be Made Profitable by 'Internalising the Externalities'? *Natural Resource Perspectives Number 46*. London: Overseas Development Institute. ISSN 1356-9228

8.3 Landell-Mills, N. & Richards M. Presentation on 'Market-based instruments to promote sustainable forest management' at PROFOR UNDP Workshop on Financing of Sustainable Forest Management, Croydon, London 11-13 October 1999

9. ITDG Publishing, 2003

9.1 Richards, M., Davies, J. and Yaron, G. 2003. 'Economic Stakeholder Analysis' for Participatory Forest Management. ODI Forestry Briefing 4, May 2003. London: Overseas Development Institute

9.2 Davies, J. & Richards, M. 1999. The Use of Economics to Assess Stakeholder Incentives in Participatory Forest Management: A Review. EU Tropical Forestry Paper 5. London: Overseas Development Institute/European Commission. ISBN 85003 476 0

9.3 Nemarundwe N. & Richards M. 2001. The Potential and Limitations of Participatory Methods for Exploring Tree and Livelihood Values. Chapter in Campbell B.& Luckert M. Eds. *Uncovering the Hidden Harvests of Rural Households: Methods for Valuing Trees and*

Forests. People and Plants Conservation Handbook. WWF/ UNESCO/ Royal Botanical Gardens, Kew

9.4 Richards M., Davies J. and Cavendish, W. 1999. Can PRA methods be used to collect economic data? A non-timber forest product case study from Zimbabwe. *PLA Notes* 36: 34-40. ISBN 1357-938X (PLA (Participatory Learning and Action) Notes is published by the Sustainable Agriculture and Livelihoods Programme of the International Institute for Environment and Development (IIED), London)

9.5 Spanish edition of ITDG book:
Richards, M., Davies, J., Yaron, G. and Guevara Sanguines, A. (In Press). Principios Economicos del Manejo Forestal Participativo: Manual para Entender los Incentivos Economicos que Enfrentan los Usuarios del Bosque. Mexico, DF: Plaza y Valdes

9.6 Chinese edition of ITDG book (In Press)

10. Journal of Forest and Livelihood, 2003

10.1 Richards, M. Maharjan, M. and Kanel, K. 2003. Economics, Poverty and Transparency: Measuring Equity in Forest User Groups. RDFN Paper 26 (7). Rural Development Forestry Network, Overseas Development Institute.
http://www.odifpeg.org.uk/publications/rdfn/26/page91.html

11. International Forestry Review, 2003

11.1 Wells, A., Del Gatto, F., Richards, M., Pommier, D. & Contreras-Hermosilla, A. (In Press). Rural Livelihoods, Forest Law and the Illegal Timber Trade in Honduras and Nicaragua. Chapter in Tacconi, L., Ed. *Stealing the Forest? Illegal Logging, Law Enforcement, Livelihoods and Markets*. London: Earthscan

11.2 Colchester, M. *with* with Marco Boscolo, Arnoldo Contreras-Hermosilla, Filippo Del Gatto, Jessica Dempsey, Guillaume Lescuyer, Krystof Obidzinski, Denis Pommier, Michael Richards, Sulaiman N. Sembiring, Luca Tacconi, Maria Teresa Vargas Rios and Adrian Wells. (2006) Justice in the forest: Rural livelihoods and forest law enforcemennt. Bogor, Indonesia: Center for International Forestry Research (CIFOR), 2006. 98p. ISBN 979-24-4618-4

11.3 Various sub-papers on illegal logging in Central America located at DFID-funded Chatham House website on illegal logging:
http://www.talailegal-centroamerica.org/eng_publications.htm

12. Unasylva, 2004

12.1 Richards, M., Palmer C., Young, C.F. & Obidzinski, K. 2003. Higher international standards or race to the bottom? The impacts of

forest product trade liberalization on forest governance. Paper presented at FAO 'Expert Consultation on Trade and Sustainable Forest Management - Impacts and Interactions', 3-5 February 2003, Rome. Background paper for FAO Global Impact Assessment of Forest Products Trade in Promotion of Sustainable Forest Management, GCP/INT/775/JPN.
http://www.fao.org/forestry/foris/data/trade/pdf/richard.pdf

13. Forest Trends, 2004

13.1 Richards, M. 2003. Forest Certification in Complex Socio-Political Settings. ETFRN News 39/40: 54-56. Wageningen: European Tropical Forest Network
www.etfrn.org/ETFRN/newsletter/news39/nl39_oip_5_2.htm

13.2 Richards, M. Progress and options for forest certification in complex governance and socio-political settings. Presented at 'International Congress on Globalisation, Localisation and Tropical Forest Management in the 21st Century' 22-23 October 2003, Amsterdam
http://www.forest-trends.org/documents/meetings/Amsterdam_2003/CertificationAmsterdam.ppt

13.3 Paper presented at International Conference on 'Forest Certification in Developing and Transitioning Societies: Social, Ecological and Economic Effects', 10-11 June 2004, Yale School of Forestry and Environmental Studies, New Haven, US
http://www.yale.edu/forestcertification/symposium/

13.4 Richards, M. 2004. What do we know about the costs and benefits of tropical timber certification? Unpublished Report for Timbmet Limited, Oxford.

Other publications and papers (ordered chronologically)

Richards M. 1979. An Exercise in the Use of Gross Margins for the Analysis of Farm Management Survey Data. *University of Malawi Journal of Social Science* 7, Zomba, Malawi

Richards M. & Agalawatte M. 1981. An Inter Agro-ecological Zone Survey of Cattle and Buffalo Management Practices in Sri Lanka. Field Document 1/GCP/SRL/30 (SWE), FAO, Rome, Italy

Richards M. & Levya C. 1985. An Example of the Use of Economic Analysis in the Definition of Research and Development Priorities: Pig Production in the Henequen Zone of Yucatan (Mexico). *Journal of Research and Development in Agriculture* 2 (1):7-17

Richards M., Navarro G., Vargas A. and Davies J. 1996. Decentralising Forest Management and Conservation in Central America. Working Paper 93. London: Overseas Development Institute

Richards M. 2001. A Review of the Effectiveness of Developing Country Participation in the Climate Change Convention Negotiations. Developing Countries' Participation in International Negotiations Working Papers. International Economic Development Group, Overseas Development Institute http://www.odi.org.uk/iedg/participation_in_negotiations/climate_change.pdf

Richards M., Maxwell S., Wadsworth J., Baumeister E., Colindres I., Laforge M., Lopéz M., Noé Pino H., Sauma P. & Walker I. 2003. Options for Rural Poverty Reduction in Central America. Briefing Paper. Overseas Devleopment Institute, London. (Also published in Spanish by RUTA, Costa Rica)

Richards M. 2003. Poverty Reduction, Equity and Climate Change: Challenges for Global Governance. Natural Resource Perspectives Number 83. Overseas Development Institute, London

Richards M. 2004. Making Sense of Rural Poverty in Central America: Lessons from the Rural Development Literature. DFID/RUTA/ODI. San Jose, Costa Rica

Richards M. 2005. Rural Poverty Reduction in Central America: Strengthening Technical, Business and Financial Services. Keynote paper at International Conference at the Tropical Agricultural Research and Higher Education Centre (CATIE) 11-13 April 2005. Turialba, Costa Rica http://www.catie.ac.cr/econegociosagricolas/BancoMedios/Documentos%20PDF/1-1%20key%20note%20-%20m%20richards.pdf

Richards M. & Suazo L. 2006. Learning from Success: Revisiting Experiences of Low External Input Technology Adoption by Hillside Farmers in Central Honduras. pp. 95-124 in Tripp R. Ed. *Self-Sufficient Agriculture. Labour and Knowledge in Small-Scale Farming.* London: Earthscan

APPENDIX 2

NUMBER OF CITATIONS AND JOURNAL IMPACT FACTORS

Table A2. Google Scholar Citations and Journal Impact Factors (publications with at least two citations

Publication reference	Google Scholar Citations	Journal Impact Factor
1. Journal of World Forest Resource Management, 1993	10	-
2. Commonwealth Forestry Review, 1993	16	-
2.1 Natural Resources Institute, 1991	9	
3. Forest Ecology and Management, 1995	4	1.577
4 (a) Environmental Conservation, 1996	19	1.493
5. Environmental Conservation, 1994	8	1.493
5.1 Mountain Research and Development, 1997	3	0.444
6 (a) Development and Change, 1997	27	0.500
6.1 Natural Resource Perspectives, 1997	8	
8. World Development, 2000	18	1.504
8.1 EU Tropical Forestry Paper 1, 1999	23	
9. ITDG Publishing, 2003	5	-
9.2 EU Tropical Forestry Paper 5, 1999	13	
10. Journal of Forest and Livelihood	4	-
11. International Forestry Review, 2003	2	0.924
13. Forest Trends, 2004	4	-

APPENDIX 3

BOOK REVIEWS AND OTHER REFERENCES

BOOK REVIEWS

Publication 7: Overseas Development Institute, 1997

Journal of Development Studies 34 (3) 1998: 155-156 by Dr Katrina Brown (Professor, School of Development Studies, University of East Anglia)

Publication 9: ITDG Publishing, 2003

International Forestry Review 6 (1) 2004: 67 by Adrian Whiteman (Senior Forestry Officer (Economic Analysis), UN Food and Agriculture Organization (FAO), Rome)

Ecological Economics 50 (1-2) 2004: 160-161 by Jayanath Ananda (School of Business, La Trobe University, Wodonga, Australia)

INFORM, Information Bulletin of The Resource Unit for Participatory Forestry (RUPFOR), Winrock International, Delhi by Dr Madhu Verma (Associate Professor, Indian Institute of Forest Management, Bhopal) www.rupfor.org/downloadq/Inform%20July%202005%20issue.pdf

Forests, Trees and Livelihoods 14 (1) 2004: 61-63 by Bill Slee (Professor of Rural Economy, University of South Gloucestershire, Cheltenham)

non-economistic manner – for example, by exploring their attitudes to risk, change and choice of opportunity rather than inferring everything from a body of economic data.

The study also promises a little more than it ultimately delivers in respect of its engagement of the theoretical underpinnings to rural industrialisation in Indonesia. In the first chapter we are fed tempting morsels relating to Piore and Sabel's 'second industrial divide' and the notion of 'flexible specialisation' in the developing world context (Piore and Sabel, 1984). In reality, the only wide concept to which the study consistently relates is Clifford Geertz's much criticised notions of 'involution' and 'shared poverty' (Geertz, 1963). Whilst the analysis refutes the notion that the textile industry in Kampung Ciluluk may be displaying involutionary characteristics, one is left wondering whether the premise of involution was a useful one to be exploring in the first place. Nonetheless, whilst the contribution of the study to wider theoretical debates and broader Indonesian contexts might be questioned, it does offer some excellent empirical detail and also some insight into the inner workings of rural production processes in a particulariy interesting locational context. As such, *Rural Industrialization in Indonesia* will be of narrow specialist interest to development economists, some Indonesianists and, if they are interested in reading detailed case study material, rural development practitioners.

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Centre for South-East Asian Studies,
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REFERENCES

Geertz, C., 1963, *Agricultural Involution: The Process of Ecological Change in Indonesia,* Berkeley, CA: University of California Press.

Panpiemras, Kosit, 1987, *Rural Industrialization in Thailand,* Bangkok: National Economic and Social Development Board.

Parnwell, M.J.G. and Suranart Khamanarong, 1996, 'Rural Industrialisation in Thailand: Village Industries as a Potential Basis for Rural Development in the North-East', in M.J.G. Parnwell (ed.), *Uneven Development in Thailand,* Aldershot: Avebury, pp.161–85.

Piore, M.J. and C.F. Sabel, 1984, *The Second Industrial Divide: Possibilities for Prosperity,* New York: Basic Books.

Missing a Moving Target? Colonist Technology Development on the Amazon Frontier. By Michael Richards. *London: Overseas Development Institute,* 1997. Pp.xvi + 94. £10.95. ISBN 0 85003 301 2

This ODI research study forms part of the output of a research programme examining the institutional aspects of natural resource management and concentrates on socio-economic aspects of frontier expansion in Amazonia. Much interest has been generated in this area because of the loss of Amazon rainforest, but the author, Michael Richards, also highlights the conditions of poverty that exist amongst many of the colonists in these frontier regions. Stabilisation of the frontier is conventionally seen as the key to slowing deforestation by colonist farmers. Although colonist farmers may be important as direct agents of deforestation in Amazonia, stabilisation would also limit access of other important agents including cattle ranchers and land speculators.

The stated objectives of this book are to provide a review of the problems faced by colonist farmers; to examine the causes of colonist instability; and to review the appropriate institutional, technological and policy responses. The book brings together

literature from a range of sources, including published material and also 'grey' literature from various research and development projects and initiatives in Amazonia.

Colonist farmers are often overlooked by development policy, and have been portrayed as the perpetrators of environmental degradation and destruction. The reality of course is far more complex, as research analysing the direct and underlying causes of deforestation has shown. The interlocking factors, endogenous and exogenous, economic, social, ecological and political form the framework determining the dynamics of the so-called frontier. These are briefly reviewed in the introduction to the book thus justifying its focus on colonist farmers.

Michael Richards provides a very useful summary of the socio-economic context of colonist technological development, and a history of colonisation of the Brazilian Amazon. Three stages of colonisation are identified and described; the early pioneer phase, the emerging market economy, and the closing frontier. These are characterised according to a number of factors, including the characteristics of the colonists themselves, systems of land tenure, land values and land speculation, government and other institutions and interventions, access to credit, off-farm income opportunities, and farming systems. Whether such an analysis is able to capture the spatial and temporal dynamics and diversity of the region is problematic. In such an abbreviated form, there is often a tendency to simplify and generalise, rather than to examine the factors which might make reality diverge from such models of frontier development. These factors may well be the most interesting from the research perspective, and the most informative from the policy perspective.

The sustainability of colonist farming systems and alternative land uses are examined in Chapter 3. Various programmes and projects are reviewed, for example, the use of green manures, cover crops, perennial cropping systems, agroforestry and different sorts of forest management strategies, including extractivism. Again these are quite briefly explained, though with reference to a number of examples from different parts of Amazonia, some of which are provided in text boxes.

Chapter 4 presents a discussion of policies to support stabilisation of the frontier. It notes that colonists are now predominantly from within the Amazon region, not from outside as in the past, and this might demand quite different approaches to stabilisation. One conclusion is that: 'policy and institutionally-based approaches are likely to be more cost-effective at influencing land use practices than technologically-based approaches, because land use practices are a response to prevailing farm-level incentives, rather than the relative availability of different sorts of technology' (p69). Does this constitute a radical shift in the emphasis of current development projects in the region I wonder? It might also be interpreted as being rather at odds with the focus on technology development in earlier sections, and reflects a slight ambiguity in this respect.

The book contains a very useful reference list and appendices, which include a review of colonisation case studies, and statistical evidence of deforestation in the Amazon region. It is certainly a very good review and summary of some of the major studies and initiatives in the region. It would provide a good background and excellent introduction to anyone new to the region and would be most useful to practitioners and policy-makers. It is well written, concise and readable. I am not sure it provides any answers, but perhaps it doesn't set out to do so. I recommend it to a range of readers in development and environment matters, both practitioners, students and those with more specific policy interests.

KATRINA BROWN
School of Development Studies,
University of East Anglia

REVIEWS

RICHARDS, M., DAVIES, J. and YARON, G. *Stakeholder incentives in participatory forest management – a manual for economic analysis*. ITDG Publishing, London. 2003. Paperback, 238 pp., ISBN 1-8533-9559-5 £19.95.

Over the last decade or so, the word 'stakeholders' has entered into everyday from use by project managers and policymakers. Forestry has followed this trend, as governments and forest managers have realised that they often cannot pursue their interests without considering the impacts of their actions on many others around them. This book focuses mainly on the economic aspects of stakeholders' behaviour, but it also gives a broad perspective on the subject of project and policy appraisal.

The book is based on the authors' considerable technical knowledge of the subject, backed-up by a large amount of research carried out in numerous countries over the last few years. The book is divided into two main parts: the first presents a general introduction to basic economic concepts, while the second presents a systematic guide to 'Economic Stakeholder Analysis' or ESA. Although forestry is already plagued by numerous different approaches to appraisal (PRA, RRA, IRA, etc.), ESA is a valuable addition to the practitioner's toolbox, as it simply takes existing and well-tried economic methodologies and applies them to the problem of participatory forest management.

The first part of the manual explains the main economic concepts used in appraisal in a simple way that should be understood by most people. It includes a discussion on the basic unit of analysis (i.e. the 'household') and economic concepts such as: costs, prices and values; marginal analysis; and accounting for time (discounting) and inflation. It also provides very useful explanations of some of the crucial assumptions that economists tend to take for granted.

The second part comprises six chapters that each correspond to one of the stages of ESA, plus a summary chapter at the end that provides some final guidance about how to perform an ESA. All of the chapters are very well organised, starting from simple approaches to defining and analysing issues, before gradually introducing more complicated techniques and methodologies. For those that are interested, it also provides a list of further reading at the end of each major topic discussed in the text.

It is particularly pleasing that there is a lot of space in the book devoted to the subject of data collection. All too often, analysts concentrate on models and calculations but pay far too little attention to the integrity and quality of the data that they are using. Almost half of the book is devoted to this. It is also good to see that the subject of monitoring and evaluation has not been overlooked.

The book doesn't use too much jargon or try to overcomplicate the subject. This makes it much more accessible to the non-expert than many of the other books that are currently available on the topic of forestry project and policy appraisal. It is also very up-to-date and makes good use of the research results obtained in recent studies. Although it is focused on participatory forest management, the book will be useful for anyone involved in forestry project and policy appraisal. The style and content of the book is clearly designed to appeal to non-economists, but even specialists might find that it contains a lot of useful information (such as the recent research results). It is also very reasonably priced, which should hopefully make it more accessible to potential readers in developing countries.

To summarise, this really is an excellent book and I commend it to anyone interested in this subject.

ADRIAN WHITEMAN

BROWN, A., REED, D. and SOARES, P. (eds.). *Modelling forest systems*. CABI Publishing, Wallingford, Oxfordshire, UK. 2003. xii + 401 pp. ISBN 0 85199 693 0. £75, hb.

The title, '*Modelling Forest Systems*', suggests that the subject is system analysis of forests as complex, non-linear natural ecosystem with a complex structure, fuzzy dynamic and interacting with a hierarchy of similarly natural and cultural ecosystems, especially with forestry and forestry-linked economic and social systems. Hence, the reader is led by the title to expect modelling in context with comprehensive system analysis and simulation for understanding, less for predicting systems embedded in a system hierarchy.

However, '*Modelling Forest Systems*' is a collection of 33 papers submitted to a workshop of researchers in forest growth, increment and yield modelling, held in Sesimbra, Portugal, 2–5 June, 2002. The papers are loosely grouped in five parts: Forest reality and modelling strategies; Mathematical approaches and reasoning; Estimation processes; Models, validation and decision under uncertainty; Model archives. A sixth part, – a synthesis of the workshop results – concludes.

The book and each of the five parts are preceded by an introduction that gives a general description of the state of the art in the subject area but does not refer directly to the contents of the respective part and its individual papers.

Part 1 on 'Forest Reality and Modelling Strategies' contains seven papers, most of which describe case studies to present tactics and principles on the handling of data populations, site mapping, carbon accounting, and choice between processing procedures. Wider reaching fundamental questions and broader system perspectives are discussed at the level of strategy in the paper by Hauhs, Knauft and Lange 'Algorithmic and Interactive Approaches to Stand Growth Modelling'. The wider reaching perspective includes the expansion from predictive algorithmic modelling to interactive modelling which opens the possibility to analyse systems at a broader and larger scale. The authors refer to the important work by Dreyfus and Dreyfus (1988) and particularly to Bent Flyvbjerg's (2002) thought-provoking book 'Making Social Science Matter'. Interactive modelling with visualisation supports the development of realistic interactive communication between modeller, model and reality, which creates knowledge, understanding and a rational basis for strategic decisions, and monitoring of reality.

Part 2 on 'Mathematical Approaches and Reasoning' consists of ten papers on a wide range of subjects. The one-page introduction gives a very general overview of principles of forest modelling and puts forward two questions concerning future work: 'How good are our models for communication?' and 'Can traditional process and statistical models be combined into a more

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doi:10.1016/j.ecolecon.2004.03.006 Cite or Link Using DOI

Book review

Stakeholder Incentives in Participatory Forest Management: A Manual for Economic Analysis

Michael Richards, Jonathan Davies and Gil Yaron, ITDG Publishing, London, 2003, ISBN: 1853395595, 238 pp.

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Available online 21 May 2004.

Participatory Forest Management (PFM) has assumed a profound significance in national and global environmental debates in recent times. The growing interest in this field is fuelled by the realization that stakeholders play a crucial role in development interventions. Lack of participation is seen as an acute problem faced by the present day development programmes in developing countries. The success and the impact of participatory development interventions have been questioned by many researchers. In the meantime, it appears that the analytical frameworks that integrate the economic analysis into PFM are scarce in the literature. Against this background, a manual detailing of the economic principles and techniques offers readers a useful analytical guide that explores the economic incentives of PFM.

The manual is comprised of nine chapters and divided into two parts: the first part (Chapters 1 and 2) deals with economic concepts for participatory forest management. The second part is comprised of seven chapters. Chapters 3–8 detail 'Economic Stakeholder Analysis' (ESA)—the analytical framework and its six stages. These chapters present the essence of the manual. The final chapter provides a summary of the approach. The title of the manual is somewhat misleading as the text is mainly concerned with applying a range of economic and Participatory Rural Appraisal (PRA) techniques in order to make better forest land-use decisions. Yet, overall the manual presents a wealth of information, covering a range of techniques, which belong to several different paradigms. The contents of the manual

are presented in a readable manner making it useful for a wide range of readers.

Chapter 1 sets out the background and the purpose of the manual. Despite the lack of emphasis on definitions of PFM, the ESA is introduced in chapter 1. ESA is presented as an extension of standard stakeholder analysis with a focus on the quantification and valuation of costs and benefits that affect the decisions of forest users. Examples based on five ESA case studies, conducted by the authors in a variety of PFM situations, are given throughout the manual. Chapter 2 focuses on economic concepts for PFM. This chapter provides a theoretical basis for understanding the economic tools used in the ESA. The reader is provided with a simple but essential introduction to the concepts such as the unit of economic analysis, Total Economic Value (TEV), basis of economic value and opportunity cost. Fairly detailed descriptions of price determination, consumer surplus, elasticity and analysis at the margin are also presented. The latter part of chapter 2 covers Cost–Benefit Analysis (CBA) and its components, market failure and policy failure and their relevance to the PFM.

Part 2 of the manual is devoted to present the ESA toolbox. Chapter 3 presents the ESA stage 1 comprising participatory rural appraisal (PRA) methods to identify, prioritize and classify forest stakeholders. Chapter 4 focuses on understanding the decision context (ESA stage 2) using a variety of PRA methods. Chapter 5 deals with the identification, prioritization and quantification of costs and benefits from alternative forest land use (ESA stage 3). A range of field research methods are suggested and several examples are provided from the case studies mentioned earlier. Valuation of costs and benefits of PFM intervention (ESA stage 4) is presented in chapter 6. The toolbox for this stage contains methods such as contingent ranking, market price analysis, opportunity cost, replacement cost, barter game and a range of non-market valuation methods. The authors draw attention to the fact that different methods may lead to different values in addition to address limitations as well as potential of each method. Chapter 7 presents a variety of economic tools such as budgeting methods, CBA, risk analysis, cost-effectiveness analysis and multiple-criteria analysis to compare various forest land-use options (ESA stage 5). The manual depicts its versatility by going beyond the conventional neo-classical economic tools and from emphasizing to the Practitioner that livelihood decisions are made on much wider criteria than profit maximization. In chapter 8, the authors endeavour to provide an overview of the participatory analysis and monitoring (ESA stage 6), an area overlooked by many participatory interventions. The final chapter (Chapter 9) provides summary guidance points of ESA. The main content of the manual is supplemented by six appendices and a glossary. Ample references are provided for further guidance at the end of each section. Moreover, annotated sources for each ESA stage and further details on economic tools are presented in the appendices.

In sum, the authors have succeeded the challenge of integrating economic analysis into participatory forest management interventions so that a more rigorous and holistic analytical framework is achieved. The text is a rich source of information for those who involved in PFM, particularly forest managers, policy advisors, economists as well as non-economists.

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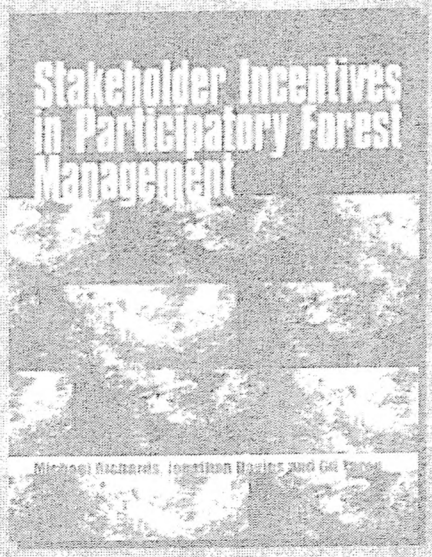
Ecological Economics
Volume 50, Issues 1-2 , 1 September 2004, Pages 160-161

Stakeholder Incentives in Participatory Forest Management – A Manual for Economic Analysis

Authors: Michael Richards, Jonathan Davies and Gil Yaron
Published by ITDG Publishing, London, UK 2003; **Price:** £19.95
Reviewed by Dr Madhu Verma, Associate Professor, Forest Resource Economic Management, Bhopal, India. Email: verma@iifm.org



RUPFOR

The manual aims to demonstrate that economic tools can usefully complement other methodological approaches in the analysis of decision making

The manual under review makes a valuable contribution in the area of forest economics and participatory forest management (PFM). To forest economics, it brings a fresh Economic Stakeholder Analysis (ESA) methodology; and to PFM an approach that stakeholders can see economic sense in adopting PFM.

The manual aims to demonstrate that economic tools can usefully complement other methodological approaches in the analysis of decision making in PFM situations and provides a tool box of economic methods which, if used appropriately, can lead to more informed decision making by PFM stakeholders. The manual provides practical and accessible guidance for using some of the less sophisticated economic tools. The main users of the manual will be those who have a formal training in agricultural or national resource economics at an undergraduate or masters level, but may have limited practical experience with PFM situation. For such practitioners, the manual elegantly bridges the gap between knowledge of economic principles and the practice of applying economic concepts and tools in conjunction with other disciplines to PFM situations. The main objective of the manual is to explain and critically examine existing and emerging economic methodologies in terms of their potential and limitations to assess stakeholder incentives in PFM.

The manual is an output from a research project undertaken by the authors and funded by the UK Department for International Development (DFID) for its use by developing countries.

The manual is organized in two sections. The first section includes introduction and concepts comprising two chapters on economic stakeholder analysis, economic concepts for PFM; the second section provides an economic stakeholder analysis tool box through seven different chapters.

The first chapter begins with a justification as to why such a manual is needed. A distinction is made between "primary" and "secondary" stakeholders depending on the level of their engagement with the issue or system. ESA is not only concerned with financial or tangible costs and benefits but also with intangible and non-marketed benefits and costs. Similarly, it is not just about how to derive estimates of non-market values in terms of a common numeric but also about resource use allocation and decision making at the farm, forest or household level. An important aspect of ESA is that it assesses costs and benefits from the perception of the decision maker or stakeholder. The chapter also provides summaries of ESA case studies from Nepal, Ghana, Bolivia, Mexico and Zimbabwe undertaken by the authors.

Chapter Two of the manual discusses the problems of dealing with time, risk and uncertainty, and multiple objectives in ESA. Beginning with a brief overview of some of the distinguished economic characteristics of forestry, the chapter argues whether there are any real differences between forestry economics and the economics of other sectors like agriculture and education. The authors opine that any policy intervention or project has to be understood firstly in terms of its potential impact and relevance at the household or farm level and then to a larger level like a forest user group, community or eco-region. The chapter further discusses a range of values or benefits that are likely to arise from forestry activities and how these values are distributed among different stakeholders.

The section concludes that much of the mismanagement and inefficient use of natural resources are when markets are imperfect, thin, or absent, and also due to policies which are inappropriate for the forest sector.

Section Two of the manual provides the toolbox for conducting ESA. Chapter Three deals with ESA stage 1, that is identification and characterization of stakeholders. The authors feel that at the end of ESA stage 1, the study team should be in a position to understand the needs, objectives and livelihood alternatives

of stakeholder group and conflicts between them.

Chapter Four introduces ESA stage 2 where the objective is to understand the decision-making context and criteria in PFM and to decide whether an economic study is necessary. Thus, at the end of this stage the team would have a much better understanding of the decision making context and the problem they are dealing with. They would also have a better understanding of the role of economics, if any, in making the decision, and what economic data is needed by evaluating alternative land use options and economic resource allocation criteria.

ESA stage 3 comprises many shortcut data collection methods so as to exercise economy of data collection. It proposes that multi-disciplinary teams comprising economists, foresters, and PRA experts should work together to get accurate data. The authors conclude that shortcut methods such as single memory recall visit are cheap and quick but are no substitute for longitudinal research methods such as multiple visit survey, participatory monitoring, researcher participation and observation, household recording, physical measurement, inventories, and permanent sample plots.

The sixth chapter is the most important component of the manual and is devoted to valuation of costs and benefits. This also makes ESA stage 4 where the objective is to estimate unit values or pricing using appropriate valuation methods. It compares financial analyses taking the viewpoint of local forest users and economic efficiency analysis which provides a wider national/society viewpoint. Seven steps that constitute the ESA stage 4 tool box are discussed in detail. The authors in a very lucid manner provide case studies within the chapter as well as in the appendix for each valuation technique, which makes the understanding and use of techniques very easy.

ESA stage 5 is presented in Chapter Seven where the objective is to carry out a comparative economic analysis of forest-based land use or livelihood options to help PFM stakeholders make better informed decisions: here the cost and benefits of alternative decision making options are identified, quantified and valued. This stage tool box comprises tools such as partial budgeting, gross margin, net margin and farm income analysis, discounting, Net Present Value, Internal Rate of Return, Benefit Cost Ratio, sensitivity analysis, risk assessment, decision analysis and other economic decision making criteria like cost-effective and multi-criteria analysis.

Throughout, the manual emphasizes that livelihood decisions are made on a much wider range of criteria and judgments rather than profit maximization. It is, therefore essential for the economist to gain a good prior understanding of the wider stakeholder decision-making criteria in ESA stage 2 and apply this knowledge when interpreting the results of comparative economic analysis.

One way that economic and scientific studies the world over have failed is that they do not discuss calculation and findings with primary beneficiaries of stakeholders. The reason may be lack of time, poor planning, lack of communication skills, or merely a top-down bias. An essential part of ESA process is that the stakeholders themselves are able to make use of the economic information which has been generated. Thus ESA stage 6 attempts to return the economic data to the primary stakeholders and discusses with them how the ESA analysis can contribute to decision making. It then verifies and triangulates the results with the stakeholders. The authors substantiate these two steps of ESA stage 6 with three very informative case studies exploring equity in community forestry in Nepal, incentives for cocoa farmers to keep timber trees in Ghana, and innovative approaches to returning economic data in the Brazilian Amazon. At the end ESA stage 6 suggests to develop a participatory monitoring system for the primary stakeholders to measure the progress of their livelihood choices.

The authors provide a continuum of such M&E systems at the level of communities, local government/NGOs, national government and donors. A very interesting case study from Prunus Africana in the upper montane forests of Mount Camaroon in the form of a reporting chart for monitoring of benefits has been presented at the end of the eighth chapter. The authors argue that an additional ESA stage is needed for secondary stakeholders in PFM. Donors and policymakers will need summary reports of the study. To do this effectively, the research team should be thinking about ways of disseminating research results from the start of the project.

The concluding chapter provides summary guidance points for performing ESA, and it is hoped that the manual will give economists the confidence to use their practical skills and experience to apply a range of economic tools in PFM. Detailed appendices at the end provide a wide range of case studies following various valuation techniques.

The authors deserve credit for providing a handy toolkit which would be relevant in the Indian scenario where large communities depend on forests but are still not convinced to join PFM projects/programs. The manual is timely and comes as an invaluable source to generate information for researchers, policy-makers, departments, NGOs and donor agencies and, above all, the communities/primary stakeholders to know if it makes economic sense to adopt PFM projects.

RUPFOR

One way that economic and scientific studies the world over have failed is that they do not discuss calculation and findings with primary beneficiaries of stakeholders.

Stakeholder Incentives in Participatory Forest Management: a Manual for Economic Analysis. Michael Richards, Jonathan Davies and Gil Yaron, ITDG Publishing, London, ISBN 1 85339 559 5 £19.95

This is a valuable book in that it contributes to bridging the gulf between the 'soft' participatory approaches to forest management that have become so fashionable and productive in less developed countries and the application of 'hard' economic principles to forest management. On the first page the authors argue that 'this manual aims to demonstrate that economic tools can usefully complement other methodological approaches in the analysis of decision-making in Participatory Forest Management (PFM) situations and provides a toolbox of economic methods, which, if used appropriately, can lead to more informed decision making'. However, retrospectively the authors almost reverse the claim, arguing it is hoped that this manual will give economists the confidence to go out and use their practical skills and experience in PFM.'(p180) So we remain slightly uncertain as to whether the authors are trying to teach economists PFM or PFM practitioners economics. Such considerations might shape the ideal structure of the book. This reviewer believes that the more appropriate target is PFM practitioners, but that, inevitably, one book alone is insufficient to skill PFM practitioners in the sometimes arcane ways of economics.

The book is laid out as a manual. After a couple of introductory chapters which make up part I, the six key stages of what is termed 'Economic Stakeholder Analysis' constitute the chapters of part II of the book. These comprise: the identification and characterisation of stakeholders; understanding the decision-making context and role of economics; identification and physical quantification of costs and benefits; valuation of costs and benefits; economic comparison of decision-making alternatives; and participatory analysis and monitoring. A summary chapter reiterates the main points and a series of Appendices expand on a the key points made in that chapter's text.

The standard layout of a chapter includes an overview, a tabular indication of the contents of the toolkit in that chapter, boxed 'issues', case study examples and indications as to where further guidance may be found, with and a concluding section summing up the key points of that stage. Such a format gives the reader a chance to assess, assimilate and reinforce the key messages.

Throughout the text, extensive use is made of examples, which undoubtedly enrich the text. These examples often come from projects with which the authors have had involvement. In addition, a number of key points are expanded upon in boxes. These boxes are most widely used in Chapter 5 and some of the points might have been made as effectively embedded in the text, rather than as boxed components. There is even some confusion between boxes and examples (unboxed) with at least one example being mistakenly(?) embedded in a box.

On p 43 the authors state that 'the main problem for SFM is that, due largely to market and policy failures it is more profitable to cut down trees than to retain or manage them.' The clear implication is that prevailing market prices and abundant external effects and market failures in less developed countries discriminate both against PFM and the poor. SFM seeks to redress these factors, but this judgement presumes that ESA will always confirm the PFM solution. Although the examples used, especially in relation to the value of NTFPs in the Amazon, support this view, there is a danger of the authors prejudging the result, rather than using the techniques to ascertain a result. All the examples relate to developing countries,

which is a pity, for there may be situations in transition economies where the some elements from the toolkit could usefully be deployed.

Elswewhere, it is argued that economic analysis is 'extractive' and that this is somehow a problem. Quite what this means is unclear. Do the authors mean that 'extractive' economic measurements are somehow inaccurate, or do they mean that accurately estimated economic values are somehow invalid because the stakeholders to whom these values relate cannot understand them? The extent to which a comprehensive and comparable set of economic values can satisfy both stakeholders and economists is not clear.

The authors recognise a need to defer to an expert at certain times. If this is a textbook for economists, as indicated at one point, one assumes that they might hold this expertise, or at least be capable of learning it. If it is a textbook for practitioners of PFM, it should undoubtedly advance their understanding of economics, but leaves this reviewer with an uneasy feeling that the PFM practitioner may not be drinking deeply enough at the Pierian spring.

There is a minor inaccuracy in the discounting table. The example in Table 2.5 is wrong. According to Appendix 3 the present value of Rs1 after one year at a 5% rate of discount should be .95 not 1.0. A further problem is that depreciation is mentioned as part of the key point summaries in a chapter on page 96 but is not explained until some thirty or so pages later on p129.

The layout can at times be unnecessarily peppered with bullet points, as between pages 82 and 88. Such excessive use of bullet points means that the key points cannot be picked out at all clearly.

All in all, this is a useful book based on a sound underlying aspiration, with many good examples to learn from, which can provide, in association with identified web-based materials, a sound grounding in basic economics applied to PFM. However, in relation to its objectives, it is not totally clear whom the target audience is, and amidst all the concern about extractive research, the real challenge is surely to ensure that decisions about forestry, as well as being better understood at local level by a range of stakeholders, are simply based on more accurate economic information. This will then help external agents and local practitioners make better-informed decisions about the management and uses of trees and forests.

If the book does not quite live up to its aspirations, it remains a valuable contribution to enhancing the economic literacy of those involved in PFM, as a result of which it might be hoped that better decision making might ensue.

Bill Slee
Professor of Rural Economy,
University of Gloucestershire

OTHER REFERENCES AND EXTRACTS FROM EMAILS

Publication 6: Development and Change, 1997

Mentioned in Keynote Address by Dr David Kaimowitz, Director General of CGIAR Center for International Forestry Research (CIFOR), Indonesia, at The Tenth Biennial Conference of International Association for the Study of Common Property (IASCP) 10 August 2004, Oaxaca, Mexico.

> 'A number of years ago, I was struck by a piece by Michael Richards that showed how market forces, migration and national forces were gradually eroding the social capital in Latin America's indigenous communities and breaking down many of their institutions for managing common property.'

www.indiana.edu/~iascp/kaimowitzkeynote.pdf
p.6, slide #12: 'Supporting old traditions, creating new ones':

Publication 9: ITDG Publishing, 2003

Email from Dr Madhu Verma, Associate Professor, Forest Resource Economics and Management, Indian Institute of Forest Management, Bhopal

29 October 2005 15:14

> 'We have couple of copies of your book in our library and have received excellent feedback by our faculty and students. I am also using it frequently both for teaching and fieldwork.'

Email from Phil Franks, Poverty-Environment Network Coordinator, CARE International

29 September 2006 12:53

> 'I have your book and in fact we are currently engaged in an action research project with ODI on the costs and beenfits (sic) of PFM in 4 countries (partly funded by this EMPAFORM project) using at least one of the tools from your book.'

Publication 10: Journal of Forest and Livelihood, 2003

Emails from Dr Maksha Maharjan, Program Coordinator, CARE Nepal, Katmandu

19 April 2003 13:07

> 'Currently equity and transparency as essential elements of governance are frequently raised in participatory natural resource management in Nepal. In this context, the CARE-Nepal is operating a program named 'Strengthened Actions for Governance in Utilization of Natural Resource' (SAGUN) with the financial support of USAID. The program includes three big components: Forestry and Buffer Zone, Irrigation and Partnership for Hydropower. As the Chief of Party of the program, I am planning to use our learning from our case studies to monitor governance in the program.'

30 October 2003 10:35

> 'Currently, we are planning to conduct a similar type of case study in the Bardia Buffer Zone Development Project as we did in the Koshi Hills. In fact, Participatory Economic Analysis is a very powerful tool to raise awareness about equitable distribution of benefits and services among the User Groups and the Policy makers. You would not believe now participatory well-being ranking for equitable distribution of benefits is mandatory in CF in Nepal. The recent CF Operational Guidelines have incorporated all these issues for sustainable and equitable CF. Who knows one day the Participatory Economic Analysis would be another integral part of CF process.'
>
> (CF = Community Forestry)

19 April 2005 16:39

> 'You will surprise to know that many students and scholars are referring our articles for their dissertation. I must say this is not our small achievement. In Nepal, the policy makers are now seriously thinking how Community Forestry be managed to make it more pro-poor and provide economic justice to the poorer households. Certainly, your research work will add more values on this part.'

LETTER FROM EDITOR OF INTERNATIONAL FORESTRY REVIEW

COMMONWEALTH FORESTRY ASSOCIATION

Linking foresters throughout the world

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Michael Richards
Claywell Cottage
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Witney OX29 7QZ

27 February 2006

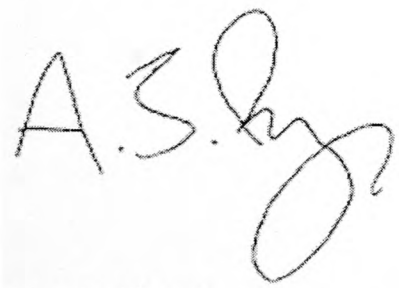
Dear Michael

Further to our discussion I would be pleased if you would consider submitting a manuscript for possible publication in the *International Forestry Review* based on your extensive experience surrounding incentives for Sustainable Forest Management. While there are many papers that deal with particular aspects of both market-based and non-market incentives I feel that there is a lack of published analysis linking the development of thought over time through to the role of regulatory incentives and forest governance issues.

I look forward to developing the paper with you.

With best wishes

Yours sincerely



Alan Pottinger
Editor, International Forestry Review

APPENDIX 4

STATEMENTS OF CO-AUTHORS
(Publications 9, 10 and 11)

Turo de Can Ponç, 3
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Spain

jonathansdavies@gmail.com

Dr. Robert Morgan
University of Glamorgan
Pontypridd
Wales
UK
CF37 1DL

Friday, April 22, 2005

Dear Dr. Morgan

Re: Michael Richards: Application to register for the award of Doctor of Philosophy by Publication

I worked closely with Michael Richards at the Overseas Development Institute on the DFID-financed Forestry Research Programme (R6914). The principal output of this programme was the publication of the manual "Stakeholder Incentives in Participatory Forest Management. A Manual for Economic Analysis" (ITDG, 2003). The manual was co-authored by Michael Richards, Gil Yaron, and myself.

Michael was the instigator of the research concept, and responsible for the programme, as well as undertaking much of fieldwork.

In my opinion the breakdown for the co-authors' contribution to the cited publication is as follows:

Michael Richards: 60%
Jonathan Davies: 25%
Gil Yaron: 15%

Yours sincerely

JS Davies

Jonathan Davies

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01 February 2006

To Whom It May Concern:

Re: Stakeholder incentives in participatory forest management by Michael Richards, Jonathan Davies and Gil Yaron

Critical appraisal of previous work

Although not included in the book, the DFID research project included a literature review of the application of natural resource economics to the analysis of participatory forestry. While the book does not have a specific section which summarises this, I think it is strongly informed by a critical appraisal of previous applications of economics to participatory forestry situations. Since MR and JD did the earlier literature review, they were mainly responsible for this aspect of the work; MR was particularly responsible for Part 1 of the Book which grounds the more practical sections (in Part 2) in a discussion of natural resources economic theory as applied to participatory forestry type situations. I helped him make these discussions accessible to a non-economist readership.

In Part 2, all the authors contributed examples from the literature which complement the case study examples derived from the five field case studies undertaken by MR and JD.

Methodology design

My contribution in this area was to help review and refine a first draft of the book that had gaps and limitations. My understanding is that MR, as the ODI project leader and responsible for reporting to the DFID Forestry Research Programme, was primarily responsible for methodology, with support from JD. From what I have seen of the field case studies they have a sound methodological design, while recognising that the data comes from fairly short-term studies.

Implementation of research

Again I had no involvement in the earlier literature review and the five field case studies led by MR and JD, but introduced some important examples into the book from my previous fieldwork, especially in Africa. Again MR was clearly the research leader. My involvement with MR in a training course in Nicaragua using an early draft of the Book also allowed me to have an important input into the later version of the book (e.g., help with language style, structure, layout, examples, etc.).

Data analysis

I contributed several examples in the book based on my own research while MR and JD focussed on the five DFID case studies. Some of these examples I also developed on an interactive website (to which MR made a more marginal contribution, and JD a more significant one) which accompanies the book.

Theory development

The book may not represent a significant contribution to theory development, but I think the development of the 'Economic Stakeholder Analysis' (ESA) framework has an importance - in terms of the state of the art - far beyond participatory forestry. Over the last decade there has been an enormous increase in interest in sustainable livelihood and poverty issues. However these have been analysed either in predominantly qualitative frameworks (like DFID's sustainable livelihoods framework) or from more quantitative perspectives involving sophisticated and disciplinary grounded methods which are not very accessible to most developing country practitioners, and are often not useful in terms of practical ways of moving forward - often because they ignore the perspectives of the primary beneficiaries. The strength of the ESA framework, which is central in this book, is that it attempts, I think successfully, to bring together more participatory livelihood based approaches which are grounded in primary stakeholder perspectives, and straightforward quantitative and traditional economic tools. This results in a reasonably empirical, livelihood and problem-focused approach which can be of benefit to the primary stakeholders in terms of helping them make decisions over the use of their livelihood resources (while admitting that it is not always possible to directly involve primary stakeholders in decisions based on economic data). Mixed qualitative and quantitative analysis is a research interest of mine but the application for participatory forest management was very much MR's personal vision, and I was happy to help him and JD develop a coherent 'field manual' type textbook for its realisation.

Gil Yaron

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To Whom It May Concern:

Re: M. Richards, J. Davies and G. Yaron (2003), *Stakeholder Incentives in Participatory Forest Management*, ITDG Publications, UK

For the purposes of his PhD assessment, I would like to confirm that Michael's contribution to this book was 60% of the total.

(Dr) Gil Yaron
Director

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January 6, 2006
IL#4736

Michael Richards
Claywell Cottage
Aston Road
Ducklington
Witney OX29 7QZ

Dear Michael,

This letter is to confirm that I agree to the following percentages for authorship responsibility for the paper "Economics, Poverty and Transparency. Measuring Equity in Forest User Groups" which appeared in the Journal of Forest and Livelihood 3 (1): 94-104

Michael Richards 50%
Maksha Maharjan 25%
Keshav Kanel 25%

My comments on our contributions to the paper, according to the categories mentioned by the University of Glamorgan, are as follows:

1. Critical appraisal of previous work:
All of three critically reviewed our previous research study methodology from 1999; all contributed to this. However your contribution to synthesize the appraisal was outstanding.

2. Methodology design:
Methodology of the research work was jointly designed.
We all contributed to in discussions, while Keshav Kanel and yourself took the lead in developing the survey and other instruments in the field. To some extent, I managed to contribute some of my experiential learning gained from the previous research works to our study.

3. Implementation of research:
Both Keshav Kanel and yourself contributed while collecting additional data. However, I managed to assist both of you.

4. Data analysis:
Your leadership and hard work for the data processing on Excel sheets, developing the gross margin analysis, the 'equity indicators', graphs, etc was very appreciable.

5. Theory development:
I think this paper did not contribute to theory per se, it did contribute to methodology development, in particular a more 'participatory livelihood economics' approach to community forestry issues, and in which we attempted to combine more traditional economic tools (like household surveys and gross margin analysis) with participatory approaches to collecting and analyzing data, with the aim of generating useful equity and gender indicators which are revealing as to the poverty impacts of community forestry. Clearly we all contributed to these discussions. However, you were responsible for synthesizing them in this paper.

Lastly, I am very confident to quote that our paper is contributing to a large extent to conduct action research on economic impacts of Community Forestry in Nepal and many researchers have been referring our paper in their studies. In this regard, I would like to propose to share our authorship responsibility in the following percentages:

Major parts of the paper	Percentages for authorship responsibility		
	Michael Richards	**Maksha R Maharjan**	**Keshav Kanel**
1. Critical appraisal of previous work:	40	30	30
2. Methodology design:	40	30	30
3. Implementation of research:	40	30	30
4. Data analysis:	80	10	10
5. Theory development:	50	25	25
Average	**50%**	**25%**	**25%**

Should you need any clarification on sharing our authorship responsibility, please let me know.

With best regard,

Yours sincerely,

Maksha R. Maharjan. Ph.D.
Program Coordinator,
CARE Nepal

Keshav Raj Kanel, Ph.D.
Resource Economist
G.P.O. 2528; Kathmandu, Nepal
krkanel@infoclub.com.np

Michael Richards
Claywell Cottage
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emrichards@ntlworld.com
January 4, 2006

Dear Michael,

This letter is to confirm that I agree to the following percentages for authorship responsibility for the paper "Economics, Poverty and Transparency. Measuring Equity in Forest User Groups" which appeared in the Journal of Forest and Livelihood 3 (1): 94-104

Michael Richards 50%
Keshav Kanel 25%
Maksha Maharjan 25%

My comments on our contributions to the paper, according to the categories mentioned by the University of Glamorgan, are as follows:

1. Critical appraisal of previous work:
   We critically reviewed our previous research study methodology from 1999; all contributed to this, and Michael did the synthesis.

2. Methodology design:
   This is something we all contributed to in discussions, while I and Michael took the lead in developing the survey and other instruments in the field

3. Implementation of research:
   Again mainly Michael and I took the lead in the implementation of the research. The questionnaires were translated into Nepali, and representatives of the users of community forests provided the actual data for the study.

4. Data analysis:
   Michael was responsible for this, doing the data processing on Excel sheets, developing the gross margin analysis, the 'equity indicators', graphs, etc

5. Theory development:
   I think we can say that while this paper did not contribute to theory per se, it did contribute to methodology development, in particular a more 'participatory livelihood economics' approach to community forestry issues, and in which we attempted to combine more traditional economic tools (like household surveys

and gross margin analysis) with participatory approaches to collecting and analysing data, with the aim of generating useful equity and gender indicators which are revealing as to the poverty impacts of community forestry. Clearly we all contributed to these discussions, and Michael was responsible for synthesing them in this paper. But maybe this is not theory development.

If you have any questions regarding this matter, please feel free to contact me in the above address.

Sincerely yours,

Keshav Raj Kanel, PH.D
Resource Economist

Overseas Development Institute

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"Impacts of illegality and barriers to legality: a diagnostic analysis of illegal logging in Honduras and Nicaragua" M. RICHARDS, A. WELLS, F. DEL GATTO, A. CONTRERAS-HERMOSILLA and D. POMMIER

Personal reference re contribution of Michael Richards to research design, execution and outcome

Adrian Wells (co-author)
Research Officer
Rural Policy and Governance Group
Overseas Development Institute
0207 922 0300
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1. Design and research methodology

Michael conceived of and led on designing the project "Governance and poverty impacts of the illegal timber trade in Central America", in partnership with research colleagues in Honduras, Nicaragua, as well as in ODI and Global Witness. This included the research methodology that formed that basis for this joint paper, spanning case study work in six field locations, analysis of the legal and institutional barriers to legality faced by small-scale forest producers and, in particular, analysis of the economic impacts in both Honduras and Nicaragua.

2. Execution of the research

While in-country analysis was undertaken by Honduran and Nicaraguan partners, as well as an FAO consultant, Michael took responsibility for routinely monitoring the quality of research reports, critical analysis of results, and their synthesis into research reports and briefing papers for dissemination.

3. Analysis of data and outcomes

Michael took particular responsibility for the economic analysis of the impacts of the illegal timber trade. See RICHARDS, M., DEL GATTO F. and ALCOCER LOPEZ, G. 2003 "The Cost of Illegal Logging in Central America. How Much are the Honduran and Nicaraguan Governments Losing?" Consultant report for the project *Illegal Logging in Central America – Tackling its impacts on Governance and Poverty*, Overseas Development Institute, London. www.talailegal-centroamerica.org.

This analysis included order of magnitude assessments of the scale of fiscal losses to the Nicaraguan and Honduran government as a result of the illegal logging trade (loss stumpage charges on production from national forest land, municipal revenues, and income tax). It also included indirect economic losses from wasted expenditure' on 'sustainable forest management' (SFM) by both national forest sector and foreign aid; as well as losses to environmental services and other national and global 'non-market' values from broadleaf forests attributable to illegal logging in Honduras and Nicaragua. The figures arising from the economic analysis were essential in securing the attention of policy makers during subsequent policy engagement.

Adrian Wells 22-2-06

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Michael Richards
Claywell Cottage
Aston Road
Ducklington
Witney OX29 7QZ
UK

04 November 2005

Dear Michael,

This letter is to confirm that I agree to the following percentages for authorship responsibility for the paper "Impacts of illegality and barriers to legality: a diagnostic analysis of illegal logging in Honduras and Nicaragua" which appeared in the International Forestry Review:

Michael Richards 35%
Adrian Wells 25%
Filippo Del Gatto 25%
Arnoldo Contreras-Hermosilla 10%
Denis Pommier 5%

Adrian Wells
Research Officer
Forest Policy and Environment Programme

Filippo Del Gatto
Colonia El Sauce, 2da Etapa, Casa E-14
31101 La Ceiba
Honduras, C.A.

Michael Richards
Claywell Cottage
Aston Road
Ducklington
Witney OX29 7QZ
UK

January 8, 2006

Dear Michael,

This letter is to confirm that I agree to the following percentages for authorship responsibility for the paper "Impacts of illegality and barriers to legality: a diagnostic analysis of illegal logging in Honduras and Nicaragua" which appeared in the International Forestry Review:

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Arnoldo Contreras-Hermosilla 10%
Denis Pommier 5%

Beyond your lead role in writing the paper for the International Forestry Review, I believe that you gave fundamental contributions to several other aspects of the work:

1) First, your contributions and comments were a key factor in the initial conception of the research idea, without which I cannot see how this study could have been developed. Furthermore, your efforts and support were also fundamental for REMBLAH[1] and myself in the relationship with the donors (DFID, World Bank, CIDA and IDB). Again, without your support I can not see how we could have managed to do it.

2) Second, I believe that you had a central role in defining the methodology of the research; in particular, in suggesting the division of the research between field case studies (focused on the implications of illegal logging and trade for communities and local people) and thematic studies at national and regional level (focused on policies and institutions as well as the economic impacts of illegal logging and trade).

3) Third, your feedback during the writing of the policy briefs was fundamental to bridge the micro-level of communities and people with the macro-level of policies and institutions.

---

[1] *Red de Manejo del Bosque Latifoliado de Honduras* (Honduran Broadleaf Forest Management Network).

4) Fourth, the entire economic analysis relied heavily on you, from the methodological setting up and supervision to the data analysis and final elaboration of the economic impacts paper.

5) Fifth, I believe that the economic analysis that you carried out is the most innovative part of the research. There have not been many attempts to the macro-economic quantification of illegal logging and trade, especially in Latin America, so this analysis represents in my opinion a significant contribution to knowledge. This is also reflected by the wide impact that this economic calculation has had in Honduras, where it has been (and continues to be) widely debated and cited by multiple stakeholders at local and national level.

Sincerely,

Filippo Del Gatto

Filippo Del Gatto

Arnoldo Contreras-Hermosilla

Michael Richards
Claywell Cottage
Aston Road
Ducklington
Witney OX29 7QZ
UK

1st November 2005

Dear Michael,

This letter is to confirm that I agree to the following percentages for authorship responsibility for the paper "Impacts of illegality and barriers to legality: a diagnostic analysis of illegal logging in Honduras and Nicaragua" which appeared in the International Forestry Review:

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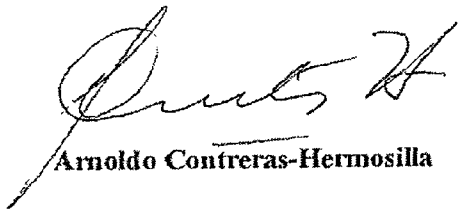
Denis Pommier 5%

Best regards



Arnoldo Contreras-Hermosilla

Denis Pommier
Apartado 1643
Managua, Nicaragua

Michael Richards
Claywell Cottage
Aston Road
Ducklington
Witney OX29 7QZ
UK

1 November 2005

Dear Michael,

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